NUNIVAK ISLAND SUBSISTENCE COD, RED SALMON AND GRAYLING FISHERIES – PAST AND PRESENT

Final Report for Study 05-353

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ABSTRACT

Nunivak Islanders (*Nuniwarmiut*) report Pacific cod (*Gadus macrocephalus*; *atgiiyar*) was a significant and consistent subsistence resource during the first half of the 20th century. Following an absence of at least 30 years, Pacific cod returned to Nunivak waters in the mid-1980s and were once again incorporated into the *Nuniwarmiut* subsistence round. This report presents an overview of traditional and contemporary Pacific cod fishing primarily collected as "traditional knowledge" from Nunivak elders, as well as from literature and archival sources. The report also summarizes the current state of the Nunivak Pacific cod fishery with results of subsistence fish surveys and documentation of fishing grounds. Secondarily, historical and contemporary use and availability of Sockeye salmon (*Oncorhynchus nerka*; *cayag*), Arctic grayling (*Thymallus arcticus*; *culugpaugar*) and other subsistence fish resources are presented. Ten *Nuniwarmiut* elders were interviewed and each provided detailed information on previously undocumented aspects of Pacific cod fishing at Nunivak Island, including locations, availability, methods, gear, processing and storage techniques.

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I. INTRODUCTION

> *They disappeared. They didn't catch anymore... they were no longer seen.* - Susie Shavings speaking about Pacific cod.

Nunivak Island subsistence fishers and elders have detailed knowledge of their environment, especially with respect to resources and habitats. This indigenous knowledge, commonly known as "traditional ecological knowledge" or "TEK" is useful to fish and wildlife managers, the scientific community and the general public. The significance, validity and value of indigenous knowledge as a counterpart to Western science is well documented and not repeated in this report (cf. Freeman 1992; Huntington 2000; Nadasdy, P. 1999; Wheeler and Craver 2005). For the purpose of this report the term "traditional" is used to refer to activities, methods and resources occurring from about 1950 and earlier. The 1950 date marks the beginning of an approximately thirty-year break in the availability of Pacific cod as a harvestable resource among the *Nuniwarmiut* (Nunivak Islanders).

This study adds significantly to the record of traditional and contemporary knowledge relating specifically to subsistence use and availability of Pacific cod (*Gadus macrocephalus*). Locally Pacific cod is also referred to as "Arctic cod," "gray cod," "P-cod," or simply "cod," among English speakers, and as "*atgiiyar"* in the Native language (known as *Cup'ig*) of the *Nuniwarmiut*. Pacific cod is an important and desirable subsistence food among the *Nuniwarmiut*, but it has received little attention from resource specialists outside of Nunivak.

In Alaskan waters Pacific cod are found along the continental shelf and upper continental slope waters of the North Pacific Ocean (Figure 1) including all of southeast Alaska, the Aleutian Islands and north into the Bering Sea, possibly as far north as the Chukchi Sea (cf. Mecklenburg et al. 2002:296).

Archeological evidence, historical literature and statements by *Nuniwarmiut* mutually indicate the subsistence fishery for Pacific cod is very different today than it was in the first half of the 20th century and earlier. This report presents changes in technology, settlement patterns and resource use in a contextual framework set apart by the total disappearance of Pacific cod from the subsistence regime at Nunivak around 1950, followed by its return and the reestablishment of the fishery in the mid-1980s.

The principal study period (roughly 1920 – present) coincides with a time of tremendous social change for the *Nuniwarmiut*. The effects of Western society and imposed governmental activities - including forced attendance at schools, unwelcome introduction of reindeer and muskoxen, imposition and adoption of Christian religion, and major legislation involving Alaska and Native lands (ANILCA and ANCSA) - had profound impacts upon the *Nuniwarmiut*, their settlement patterns, access to resources, and traditional subsistence practices (cf. Griffin 2004; Pratt 1994; Pratt 2009; USBIA 1995[1]).

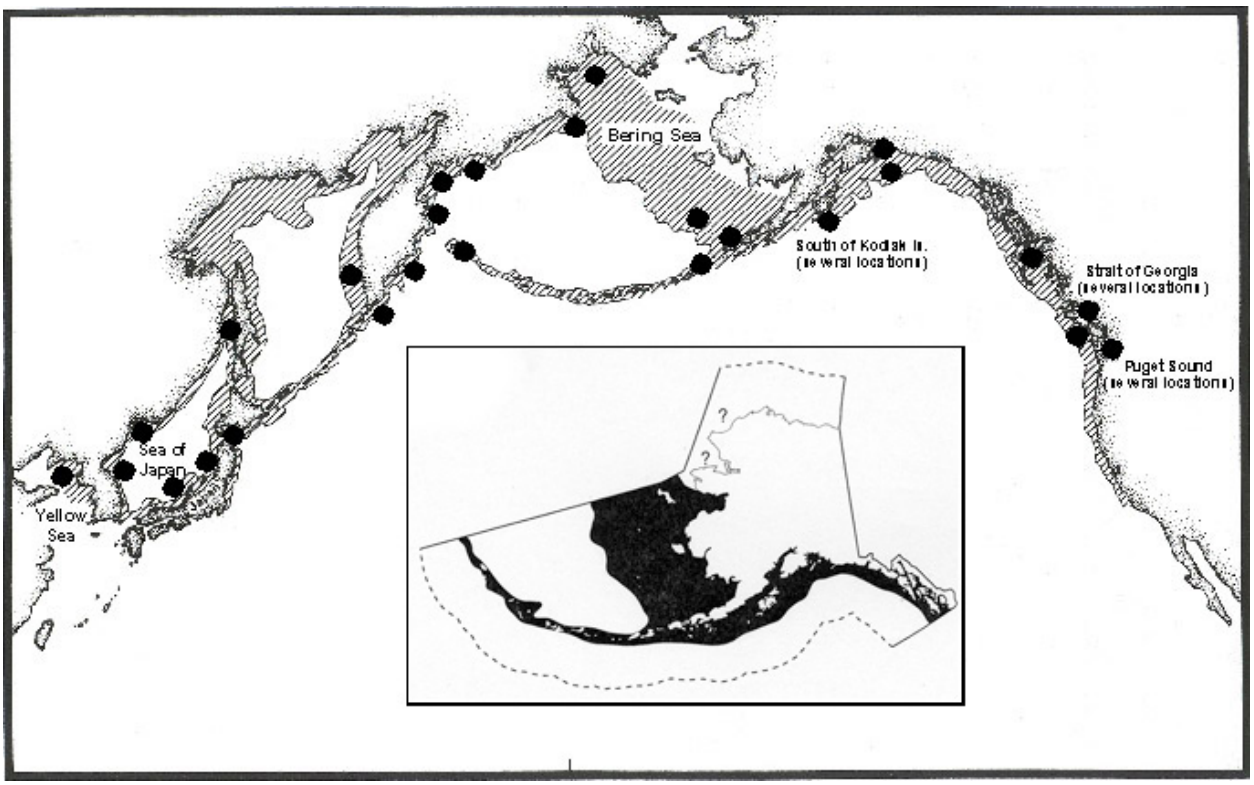

Figure 1: Geographic distribution (cross hatching) and major known spawning locations (●) of Pacific cod, modified from Bakkala et al. (1984, in Gustafson et al., 2000). Inset map showing expanded Bering Sea range, possibly into the Chukchi Sea, from Mecklenburg et al. (2002:296).

The focus of this study was Pacific cod, however, limited attention was also directed at determining harvest locations and documenting traditional knowledge relating to sockeye salmon (*Oncorhynchus nerka*; *cayag*) and Arctic grayling (*Thymallus arcticus*; *culugpaugar*). Information was also recorded for other fish species at Nunivak including capelin (*Mallotus vullosus*; *cik'ar*), Pacific halibut (*Hippoglossus stenolepis*; *cagir*), Pacific herring (*Clupea pallasi*; *iqalluarpag*), walleye pollock (*Theragra chalcogramma*; *kalagar*), saffron cod (*Eleginus gracilis*; *iqalluar*), chum salmon (*Oncorhynchus keta*; *mac'utar*), coho salmon (*O. Kisutch*; *ciayuryar*), Chinook salmon (*O. tshawytscha*; *taryaqvag*), eulachon (*Thaleichthys pacificus*; *quss'ur*), Dolly Varden (*Salvelinus malma*; *iqalluyagar*), Arctic char (*Salvelinus alpinus*; *irunar*), Alaska blackfish (*Dallia pectoralis*; *can'gir, taqikar*), and unidentified sculpin and flounder species (Table 1).

The study also addressed the lack of published data on Nunivak subsistence fisheries and shortcomings of previous surveys that neglected (or underestimated) the significance of the Pacific cod harvest in the past and present economy of the *Nuniwarmiut*. The project engaged local people in the process of documenting their subsistence resources. Through collaboration with *Nuniwarmiut* and by employing residents of Mekoryuk, important information was systematically recorded. By recording traditional knowledge and conducting comprehensive surveys of subsistence resource users the study contributes significantly to baseline information where, outside of the community, very little existed before. Further, the study report presents and discusses specific methodologies involved in the documentation of traditional knowledge with Nunivak elders and in the processing of orally contributed data.

Table 1: Cup'ig names of Nunivak fish species with English, scientific and relevant equivalents.

Language/dialect codes and source: AL = Aleut (Bergsland 1994); BBa = Bristol Bay (LaVine et al. 2007); BBb = Bristol Bay (Fall et al. 1996); KPA = Kenai Peninsula Alutiiq (Leer 1978); NIa=Nelson Island (Fienup-Riordan 1983); SLI = Siberian Yupik – St. Lawrence Island (Walunga 1987); Abbreviations from Yup'ik Eskimo Dictionary (YED) (Jacobson 1984) - GCY = General Central Yup'ik, BB = Bristol Bay, K = Kuskokwim, HBC = Hooper Bay-Chevak, LI = Lake Iliamna, NS = Norton Sound, NUN = Nunivak, NI = Nelson Island, Y = Yukon.

Cup'ig Term (Amos & Amos 2003; +Oral Sources)	English Common Names	Scientific Name	Equivalents/Notes
amaqsug+	pink salmon humpy	Oncorhynchus gorbuscha	amaqaayak (BBa)(BB)(K)(LI); amaqsuq/amaqsuk (NUN); amaghtu (SLI)
amqalat+	rockfish	?	
atgiiyar	Pacific cod p-cod gray cod Arctic cod	Gadus macrocephalus	manignaalleryak (BBa), ceturrnaq (BBb); atxidax̂ (AL). Note: "atgiaq"= *Lota lota* (BBa); in YED "atgiaq (BB), atgiiyaq (NUN) misidentified as Arctic cod (*Microgadus proximus*)"
cagir	Pacific halibut	Hippoglossus stenolepis	cagiq (NUN); cagit (NIa); naternarpak (GCY); cagix̂ (AL)
can'gir, taqikar	Alaska blackfish	Dallia pectoralis	imangat (NIa); can'giiq (K, BB, HBC, NUN), imangaq (GCY)
cayag	sockeye salmon red salmon	Oncorhynchus nerka	kavirliit (NIa); cayak/sayak (GCY); sayalleq (LI)
ciayuryar	coho salmon silver salmon	Oncorhynchus kisutch	caayuryaq (NUN, NS); qakiiyaq (GCY); qavlunaq (HBC); uqurliq (Y); qakiidax̂ (AL)
cik'ar	capelin candlefish	Mallotus villosus	cikaaq(GCY); sikaaq (SLI)
cingayag	?	?	unidentified - type birds catch, thin, bluish color
cukileg	stickleback needlefish	Gasterosteus aculeatus (three spine)	Note: cukilek (GCY), YED has "*Pungitius pungitius*" (nine spine)
culugpaugar	Arctic grayling	Thymallus arcticus	culugpauk, culugpaugaq, nakrulluqpak (GCY)
iqalluar; iqallug; neqa	fish (general)	n/a	iqalluk (NUN), neqa (GCY)
iqalluar (saffron cod)	saffron cod tomcod (at Nunivak)	Eleginus gracilis	iqalluut/iqalluat (NIa – not identified by scientific name). Note: YED iqalluaq (NUN) is misidentified as "Arctic cod, *Microgadus proximus*"
iqalluarpag	Pacific herring	Clupea pallasii	iqalluarpiit (NIa); iqalluarpak (BBa)(GCY)(KP), iqallugpak (Y); neqalluarpak(GCY)
iqallugnar	shark	?	yugtutuli (GCY)
iqalluyagar	Dolly Varden trout	Salvelinus malma	iqallugpik (GCY); iqalluigpik (BBa); iqallupik (SLI)
irunar	Arctic char trout lake trout	Salvelinus alpinus	yugyak (BB); yugyaq (BBa)(LI); Note: YED has irunaq (GCY) "steelhead trout (*Salmo gairdneri*) [*Oncorhynchus mykiss*?]"
kalagar	walleye pollock	Theragra Chalcogramma	Note: YED kalagaq (NUN) is misidentified as "sculpin"
kangitner	trout, red-bellied	?	Note: kangitneq is identified as chum salmon in (BBa)(BB)(K)

Cup'ig Term (Amos & Amos 2003; +Oral Sources)	English Common Names	Scientific Name	Equivalents/Notes
kayur	Sculpin sp. bullhead	Family: Cottidae	kayu (NUN); kayupik [Pacific staghorn sculpin] (SLI); Notes: YED kalagaq (NUN) appears to be error, see pollock); cf. kuhyu-x̂ (AL) Myoxocephalus polyacanthocephalus, "great sculpin; kuhyuliika-x̂ (AL) Myoxocephalus verrucosus, warty sculpin;.Yupik ethnotaxonomy of sculpin is poorly documented.
kayurpag	sculpin giant, in ocean Irish Lord (?)	Family: Cottidae	kayurpak (NUN)(NI)
kayurrlugar	sculpin giant, in rivers	Family: Cottidae	kayurrlugaq (HBC)
kelevyagciar	sculpin, with barbel	Family: Cottidae	with barbel, similar to a qengaruwagar
kilirnar	sculpin, small, thin	Family: Cottidae	
mac'utar	chum salmon dog salmon	Oncorhynchus keta	mac'utaq (NUN); aluyak (BB)(LI); iqalluk, kangitneq (BBa)(BB)(K); teggmaarrluk (GCY); note: Macutaq – "cod fish egg", macutiit – "cod fish spawn" (Alutiiq, Tape:ANLC 2596 SU:9); maccutak 'codfish egg' Alutiiq (Fortescue et al.1994:184)
nalayar	salmon, post spawning	Oncorhynchus sp.	YED, "spawning" - nalayaq/talayaq (NUN), talayaq (Y)(HBC)
naptar	least cisco whitefish	Coregonus sardinella	naptaq (HBC, NUN, NI); kassiaq (BBa)
naternar	flounder, in bay	?	naternat (NIa, "smooth-skinned" flounder)
naternarnar	flounder, in ocean	?	cagiq, naternaq, sagiq (GCY)
nepcar	sculpin, small sharp-nosed found in reefs	?	nepcaq (NUN, small type of sucker fish)
qengaruwagar	sculpin, with pointed nose and orange spots	?	
quaryarnar	yellow-fin sole	Limanda aspera	
quggautnarpag	wolf eel wolf fish	Anarhichas sp	qugautnaq (NI)(NUN)
quss'ur	eulachon hooligan smelt	Thaleichthys pacificus	note: qussuk (Y); qusuuq/quyuuq (HBC), identified as boreal smelt, Osmerus eperlanus in YED.
taryaqvag	Chinook salmon king salmon	Oncorhynchus tshawytscha	taryaqviit (NI); kiagtaq; taryaqvak (GCY); tarsarpak (NSU)
tuqumkassua	sculpin, small with striped markings around jaw	?	
uqurlir+	?	?	(unknown) literally "fatty"; Note: YED identifies uqurliq (Y) as silver salmon
uraru	starry flounder	Platichthys stellatus	urarut (NIa); naternaq (GCY), also said to be *Atheresthes stomias*); uraluq (BB); uraruq (NUN)(HBC); cagiq/sagiq? (GCY)

Geographic and Cultural Setting

Nunivak, the second largest island in the Bering Sea, is isolated both physically and linguistically from mainland Alaska (Figure 2). Mekoryuk (*Mikuryarmiut*), with a population in 2006 of 217 (ADCRA 2008), is the most geographically remote village in the Kuskokwim area. Young *Nuniwarmiut* primarily speak English, while the elders interviewed for this project are first language Cup'ig speakers with few English skills. The *Nuniwarmiut* are striving to document, preserve and continue use of their Native Cup'ig language, considered a distinct and highly divergent form of Central Yup'ik Eskimo (Amos and Amos 2003; Drozda 2007; Jacobson 1984:35; 2003).

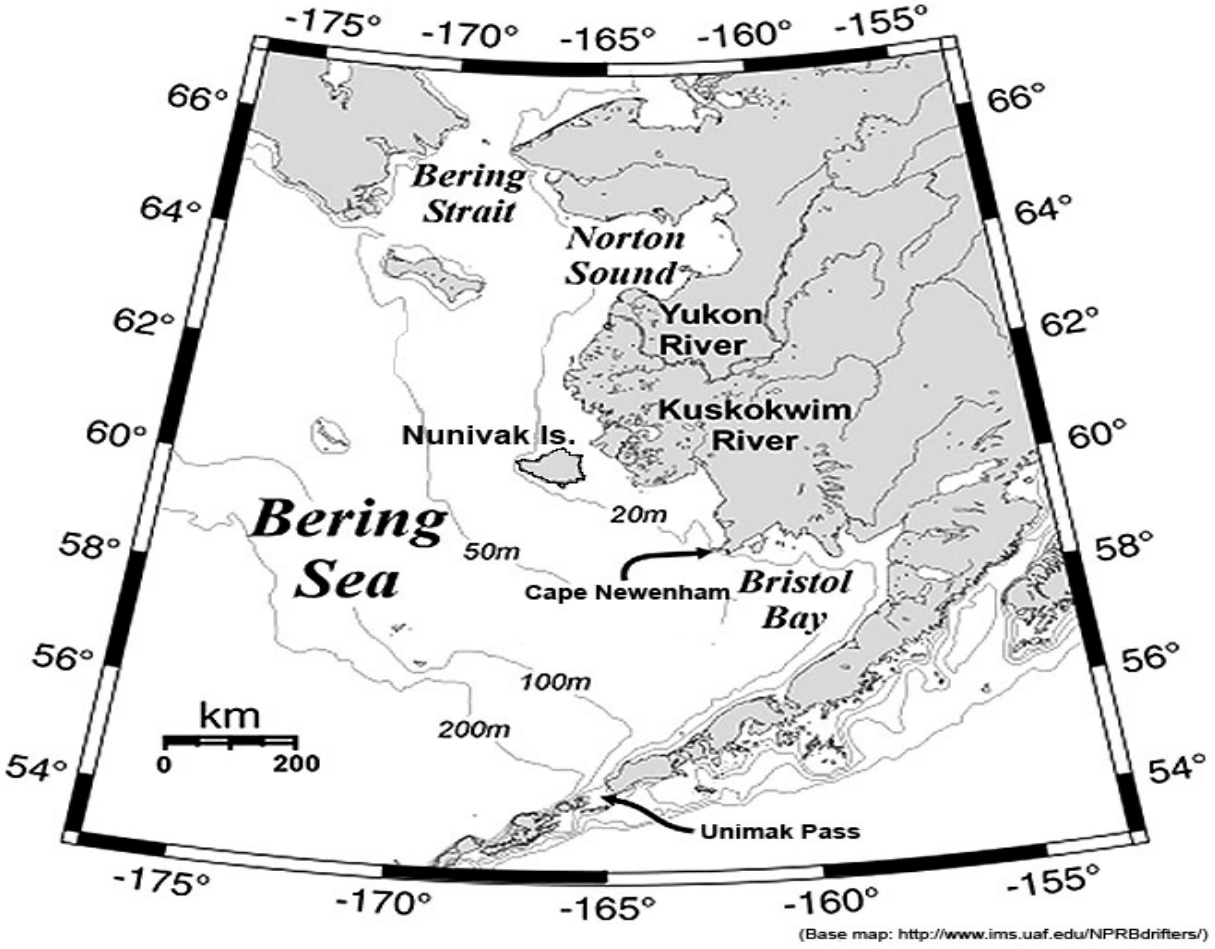

Figure 2: Nunivak-centered Bering Sea with general bathymetry (base map courtesy King et al. 2003).

The *Nuniwarmiut* are considered one of the last Eskimo groups to undergo the effects of contact with Western society. Anthropologist James VanStone noted: "The island and adjoining mainland remained unknown to European explorers long after the rest of coastal Alaska had been explored" (1957:97). Margaret Lantis (1946:161) described 1940 as "undoubtedly the end of an era" at Nunivak, representing "the old times" and concluded, "In 1939-40 Nunivak was about fifty years behind Nome, Unalakleet, or Bethel in acculturation" (Lantis1960:vi).

Despite the presence of winter shore-fast sea ice it is not possible to travel the relatively short distance between Nunivak and Nelson Island – less than 20 miles at their closest points - during the

winter months. Griffin (2004:116) stated, "It is well established that the currents in Etolin Strait are so strong that the ice never freezes over entirely and this is one reason for the relative isolation of the *Nuniwarmiut* culture." Nunivak elder Joe David (2005) recounted a story told at Mekoryuk of a failed attempt by a non-native shipwreck survivor to walk to Nelson Island. Feeling stranded the man looked across the strait at Nelson Island, noting its nearness:

> "Man they're close." He said, "Close enough that I could walk over them." So everybody say, "No, between mainland and the island it don't close." They tell him like that. But he try it one time and that's the end of him.

In modern times Mekoryuk remains one of the most difficult villages in the Yukon-Kuskokwim region to reach. Nunivak weather is strongly influenced by the surrounding Bering Sea; frequent fog, intense storms and high winds regularly disrupt air service and contribute to high delivery costs of goods, services and energy. The relative inaccessibility of Nunivak contributes to the lack of information or understanding regarding contemporary subsistence resources and procurement methods, including those that may be unique to the island population.

High costs associated with travel may also account for some of the lack of information about Mekoryuk. The Alaska Department of Fish and Game (ADF&G) regularly cites budget constraints for its inability to conduct house to house surveys in Mekoryuk (ADF&G 2001, 2002, 2003a, 2003b, 2005). Other typical methods of collecting subsistence information such as postcard surveys are largely ignored by *Nuniwarmiut*. There is some limited data for salmon species but practically no harvest information exists for Pacific cod. This project overcame these limiting factors by engaging local residents in the process of documenting their subsistence resources.

Land Status

In 1929 Nunivak Island was reserved as a federal refuge and breeding ground for wild birds, game, and furbearing animals. Offshore islets and lands under the waters surrounding the island to three miles from the shoreline were added to the refuge in 1930. In 1980 the Alaska National Interest Lands Conservation Act (ANILCA) established the Nunivak Wilderness Area (USFWS 2006).

Mekoryuk (Plate 1) and all of Nunivak Island lie within the Yukon Delta National Wildlife Refuge. Roughly half of the island is federally designated wilderness - it is a rugged, wild and biologically diverse landscape. Dozens of parcels of land first identified and surveyed as part of ANCSA 14(h)(1) investigations, and subsequently conveyed to Calista Corporation have been transferred to the local village corporation (Nunivak Island Mekoryuk Alaska [NIMA] Corporation). These are primarily former village sites, historical fish camps and cemeteries; many continue to see seasonal use as camps for subsistence-based activities (cf. US BIA 1995).

Subsistence fishing for Pacific cod (as well as halibut) generally takes place within three miles of the perimeter of Nunivak Island. Mekoryuk village supports a commercial halibut fishery with a processing facility and freezer operated by Coastal Villages Seafoods, LLC. Salmon, trout and other fish are taken in many of the island streams. Pacific cod subsistence fisheries are open year round to residents of Mekoryuk in the Yukon Delta National Wildlife Refuge waters of Nunivak Island. The study area includes off-shore fishing grounds, streams and associated seasonal fish camps on Nunivak.

Plate 1: Aerial view of Mekoryuk village and boat harbor. Shoal Bay (*Mikuryarmiut Taciat*) borders the village to the east and south, while a beach on the Bering Sea coast can be seen north of the village in the lower right of the photo. The Mekoryuk River extends south into the island's interior.

Subsistence Fishery

> In those days when they didn't have any groceries, I mean store to buy food and stuff like that, that's all they depend on, is what they can get all from the sea or from salmon. – Hilma Shavings

The development of an investigative plan for this study included a preliminary survey identifying 27 Mekoryuk families as participants in subsistence fishing activities. As part of the plan the contemporary subsistence fishing cycle was explained by Amos (2004) and is summarized below appended with some information from the current study.

Local Summary of Contemporary Subsistence Fishery

Pacific Cod. In spring as soon as the shore-fast ice clears Pacific cod are pursued. Some residents of Mekoryuk believe cod feed on herring and that is the reason for their early arrival. Beginning in the mid-1980s - when cod became available again - most of the fish campers caught it in large numbers. Since that time the populations have reportedly fluctuated.

Pacific cod is a very desirable resource; when available in significant quantity it is vigorously harvested by the subsistence fishers. Local commercial halibut fishers also keep, for personal use, Pacific cod caught incidentally on longlines. Some *Nuniwarmiut* believe that the foreign fishing

fleets and other large capacity fishery industries have contributed to the drop in numbers of cod over time.

Sockeye Salmon. Sockeye (red salmon) are not taken in large numbers by the *Nuniwarmiut*, and in this way they are considered a supplemental dietary fish. Sockeye are reportedly available in significant numbers in the stream *Cingillret* in the vicinity of *Tacirrarmiut*, where they may be targeted and taken opportunistically. The fish enter *Cingillret* in early spring, too early for harvest by those who typically camp in the area during the latter part of June and early July. Therefore, they are rarely targeted because of the run timing and the long distance from Mekoryuk to *Tacirrarmiut*.

Our current study included statements from individuals indicating a run of red salmon in one or more streams of the *Paamiut* drainage system. The Cup'ig name of one of those streams, *Cayalegar,* has the literal translation "one with red salmon." Apparently the *Cayalegar* run is not often targeted, perhaps occurring at an inopportune time or in numbers that do not justify the effort to reach them. One person thought red salmon were increasing in the *Paamiut* area (personal communication, Dan Olrun). Red salmon and Chinook salmon, described as "stragglers (*tam'akut*)" may also occur in other streams.

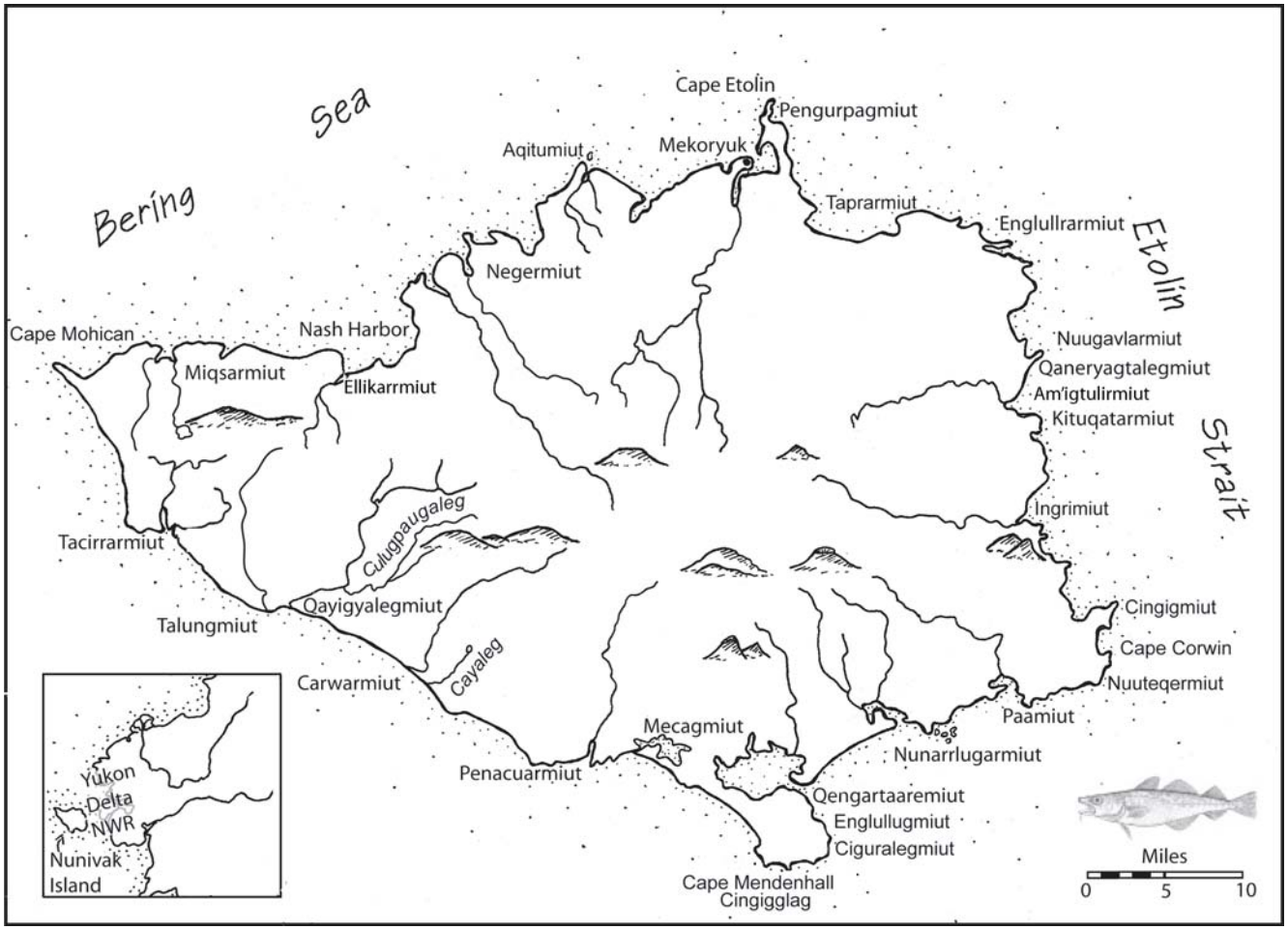

Figure 3: Nunivak Island with general locations of primary sites and features discussed in text. Nearly 100 specific places were mentioned during interviews; all place names and detailed maps are presented in Appendices A and B.

Grayling. Arctic grayling is also considered a supplemental fish and may be taken at any time of the year only in the river of *Qayigyalegmiut*. In early winter men may intentionally travel there by snowmachine to fish for grayling and Dolly Varden. To some these fish are a necessary and welcome part of the diet, available fresh during the time of the year when chum (dog) and coho (silver) salmon are few. At *Qayigyalegmiut Kuigat* (River) a tributary stream named *Culugpaugaleg* ("one with Arctic grayling") enters the river near the upper end of the long estuary *Qayigyalegmiut Taciat.* The name *Culugpaugaleg* undoubtedly reflects the presence and availability of the resource. Grayling and red salmon are not considered nearly as important in the diet of the *Nuniwarmiut* as are Pacific cod.

Chum Salmon. The most important subsistence fish is chum salmon. Twenty years ago, it was not unusual for a family to secure between 500 - 800 chum salmon within a 2-4 week period. Today, because of an increased reliance on Western foods, that number has dwindled to about 100 - 400 (compare with U.S. Fish and Wildlife Service [Hout 1966:21] estimate of about 350 chum salmon per family in the mid-1960s). The number of *Nuniwarmiut* traveling to fish camps continues to decline also, due to high oil and gasoline prices, cost of boats and outboards, wage employment, and a higher reliance on a cash economy. *Nuniwarmiut* continue to harvest halibut and Pacific cod during the chum salmon runs, however, Pacific cod availability has lessened considerably by the time most are pursuing chum salmon.

Other Species. In addition to those fish discussed above the following fish are dried and considered important to subsistence users as a supplement to chum salmon: herring, trout (Dolly Varden and Arctic char), coho salmon, sculpin, flounder, saffron cod, blackfish, and capelin. Amos concluded his summary by saying, "The supplementary fishes are extremely important, as Westerners cannot have beef alone, so do Cup'ig Eskimos from Nunivak Island (need a variety of fish)" (Amos 2004).

An Elder's View of Subsistence

Nuniwarmiut have strong and deeply rooted opinions regarding land and resource ownership (cf. Griffin 2004; Pratt 1994) with perceived and real restrictions on their subsistence based activities. Mekoryuk elder, the late Jack U. Williams, Sr. (1991b) spoke to the issue and the differences in ideologies between Westerners and the *Nuniwarmiut*:

> Today the regulations of the (Alaska Department of) Fish and Game and (U.S.) Fish and Wildlife (Service) are so astoundingly plenty, that sometimes we go hungry. They surely aren't like my ancestors. Our ancestors taught us to catch as many or all game in our pathway. Sometimes I attend the meetings of the Fish and Wildlife and Fish and Game. The regulations our ancestors didn't make, the Fish and Wildlife and Fish and Game created with power to stop subsistence needs. There was no other law, no other regulation, before we heard about the *Kass'aq* (White man) law. Our ancestors expected us to follow their regulations; there was no more powerful law.
>
> In the villages, all villages on Nunivak were instructed to bury the bones of any game into the ground and cover them with rocks. You gather the bones and then cover them with rocks, hoping that in the future game would be easier to get. So if you take care of the remains, you are telling the caribou that we will take care of you, even if it's your remains. Our ancestors taught us that all the bones and skin of all game should be taken care of properly. That goes for seals, of fish, even the skin of the fish is discarded certainly with respect.

These are the Cup'ig laws, maybe I'll think of some others as questions are being asked. Elders usually forget some things but recall when asked about them. Young man you will not have a fresh alert memory all the time, if you live that long. You will tend to forget although you had a sharp memory. You will probably have a forgetful memory also, one of these days.

Today the young people are lucky, unlike my ancestors. You are able to write and read, to recall all ideas on paper. My ancestors weren't so. Our ancestors who told their people in *qasgig* (men's community house) talked seriously. No laughing occurred during these meetings. They thought about the future and past of the relatives. There was no noise.

Project Objectives and Summary Results

Objective 1. Accurately record by Global Positioning System (GPS) coordinates and map 11 traditional cod fishing areas; record sea depth, relative school size and sea temperatures when possible.

Sixteen sites from which cod fishing occurred were identified through interviews. GPS coordinate sets and sea depths were obtained for five pelagic zones and coordinates were obtained and descriptions made relative to six streams and or estuaries.

Objective 2. Interview campers regarding codfish catch at various locations in proximity to their camp locations.

While campers were observed at several camps, field interviews proved impractical. The project survey ended before most *Nuniwarmiut* had set up camps. Several camps were observed, primarily in the *Paamiut* area, which belonged to commercial halibut fishers based outside of Mekoryuk. A comprehensive subsistence fishing survey was conducted in late summer 2007 after fish campers had returned to Mekoryuk.

Objective 3. Survey local commercial halibut fishers who use the Mekoryuk fish processing plant regarding their Pacific cod incidental catch.

Commercial fishers were surveyed over two seasons (2005-2006). The original plan called for surveys in just one season.

Objective 4. Conduct literature and internet searches to identify ethnographic and biological sources relating to historic harvest methods, fishing grounds, resource use, abundance and significance of Pacific cod, red salmon and Arctic grayling.

A literature search revealed numerous references to "cod" (presumably Pacific cod) at Nunivak but a lack of substantive data or in-depth analysis. Significant gaps and some errors in the published literature regarding subsistence use of the project target species at Nunivak Island were also revealed. Information from primary sources was summarized. A comprehensive glossary of fish species and terms relating to fishing activities and equipment were compiled and entered into a MS Access database and presented in this report.

As part of this project an archival "semi-rare" edition of Lantis' 1946 work was made available by the University of Alaska Fairbanks (UAF) Archives for digital reproduction. High quality reproductions were bound and distributed to the NPT and the *Nuniwarmiut* School in Mekoryuk, as well as the UAF library for their general collections.

Objective 5. Review existing Nunivak oral history records to develop a historical context for cod, grayling and salmon harvests.

Review was limited primarily to electronic documents in the collections of the Bureau of Indian Affairs Alaska Native Claims Settlement Act Office (BIA ANCSA). Statements relating to the three primary target species are included in this report.

Objective 6. Identify archives and museums with holdings relevant to Nunivak Island.

Objective minimally met due to lack of time and inadequate funding. Two Alaska museums were visited where Nunivak collections were viewed with guidance from museum curators.

Objective 7. Conduct interviews with key informants on the historic and contemporary availability, harvest and use of the Pacific cod, red salmon and Arctic grayling and their importance to the subsistence economy of Nunivak Island.

Ten elders were interviewed, resulting in 12 recordings and 230 pages of bilingual transcription.

Schedule Modifications

Schedule modifications allowed investigators to conduct traditional knowledge interviews and compile background materials from literature searches and archival records in the first year of the project. The year one performance period was also extended through June 30, 2006 to accommodate subsistence field surveys in May and June, 2006. The schedule modification had several positive benefits: i) it allowed the investigators to narrow the focus of potential field survey locations by collecting information from elders and commercial fisherman prior to fieldwork; ii) it provided the opportunity to gather incidental catch data from commercial halibut fisherman for two years rather than just one year as originally planned; iii) it allowed refinements in the data collection method to encourage increased participation from fishers; and iv) it enabled the investigators to make a preliminary field trip to scope potential camp and survey locations and test equipment in preparation for the planned circumnavigation.

Oral history tape processing was the most time consuming part of the project. Extensions of the project report deadline were necessary to complete the translation, transcription and summary analysis of the recordings.

Place Names and Cup'ig Orthography

Native language place names are integral to understanding and interpreting studies relating to the natural resources of Nunivak. Cup'ig names presented in this report, representing about 10 percent of the entire corpus of documented names (Drozda 1998), are for the most part written according to the current Cup'ig orthography (Amos and Amos 2003). Cup'ig names are the default even when United States Geological Survey (USGS) names occur, as the latter are presented in an unrecognized orthography and may be misplaced on official maps. The main exception to the spelling convention is in the presentation of names of major capes, which are given according to their official English map names (e.g., Cape Corwin). *Nuniwarmiut* commonly use these English names as well, however, in at least two cases they have a different interpretation from USGS as to the feature the name applies.

Two other exceptions present themselves in the use of the officially recognized names for the villages of *Mikuryarmiut* (i.e., Mekoryuk), and the now abandoned *Ellikarrmiut* (i.e. Nash Harbor). While Mekoryuk is simply an Anglicized form of the Cup'ig name, the name situation with respect to Nash Harbor is complex. Today the names Nash Harbor and *Ellikarrmiut* are used synonymously, however, the name *Qimugglugpagmiut* may also be included as a Cup'ig variant for Nash Harbor. The name has fallen out of use but is accurate as the traditional name for the western part of the site. Further, "Nash Harbor" is used locally to refer to the general area and also occurs on USGS maps as the official name of the bay on which the site rests. Interestingly, this bay has no

recorded Cup'ig name. Place names occurring in the report are presented in Appendix A, listed alphabetically with English glosses, variant names or spellings, source data and comments.

At Nunivak, as in mainland Central Yup'ik, it is common within English texts to refer to places that were once inhabited (or are still inhabited) with the post base "*–miut*," the plural form of "*-miu*" ("inhabitant of/resident of" [Jacobson 1984:499], or "to stay in/to be in" [Amos and Amos 2003:380]). For example, a settlement at the base of a cliff named *Penacuar* ("little bluff") is inhabited by *Penacuarmiut* ("residents of *Penacuar*"). The "*miut*" ending has also become synonymous with "village," so here we have translated it as both "village of (place)" and "residents of (place)." For example, *Ellikarrmiut*, "village/residents of the *Ellikarer* (whetstone)," refers to both a specific village site and also to the primary inhabitants of that place – whether they currently reside there or not. Similarly, *Nuniwarmiut* are persons of Nunivak descent even if they currently reside in Anchorage or Philadelphia.

The Cup'ig orthography used in this report is consistent with the *Cup'ig Eskimo Dictionary* (Amos and Amos 2003). The dictionary was developed by the *Nuniwarmiut* in collaboration with and published by the Alaska Native Language Center (ANLC). The Cup'ig writing system accurately reflects *Nuniwarmiut* speech patterns and pronunciation without the special rules required to accommodate the standard Central Yup'ik orthography (Jacobson 1984:35-37) to the Cup'ig or *Nuniwarmiut* dialect (abbreviated as NUN by Jacobson and ANLC). The Cup'ig orthography has also been adopted by the Lower Kuskokwim School District for Nunivak educational materials.

Taxonomy

Several factors contribute to difficulties in interpretation of fish names at Nunivak, including: i) the inconsistent use of a variety of English common names for fish species (both in the literature and among the *Nuniwarmiut*); ii) lack of familiarity with Nunivak terminology (both English and Native language) among outsiders; and iii) significant differences between the resource lexicon of Nunivak Cup'ig and Central Yup'ik. These factors cause confusion or misidentification of species, including repeated errors in the literature, and may lead to further mistakes when researching Nunivak fish species or natural resources in general.

This work clarifies names used by the *Nuniwarmiut* and corrects errors or identifies mistakes of interpretation in the published literature. Table 1 presents a comprehensive list of terms for 34 species of fish identified by *Nuniwarmiut*. Specific examples of problems relating to fish identification are presented in Part IV (Inconsistencies in the Fish Lexicon) and in the Discussion section of this report.

II. METHODS

The project consisted of four components: i) field survey of traditional and contemporary fishing grounds; ii) subsistence fish harvest surveys; iii) literature review; and iv) interviews with past and present users of the primary study resource Pacific cod, *Gadus macrocephalus*. Methods and results are presented in order of the four components.

Field Surveys of Traditional and Contemporary Fishing Grounds

Pre-survey Reconnaissance

A near-shore boat trip on June 15-16, 2005, from Mekoryuk to *Nunarrlugarmiut* allowed testing of marine and field equipment, scoping of landing sites and reconnoiter of potential fuel cache locations in preparation for the following seasons' field work. Fuel caches were made in March 2006 at *Englullrarmiut*, *Nunarrlugarmiut* and *Tuqsug* in preparation for spring circumnavigation. Each cache consisted of two sealed 55-gallon drums of gasoline - delivered by means of two separate snowmachine trips from Mekoryuk.

Plate 2: F/V Cape Corwin anchored at *Nunarrlugarmiut*, June 2006.

Survey Trip

Circumnavigation of the island occurred June 18 - 25, 2006. A modified herring trawler, the *Cape Corwin*, a 30-foot aluminum hulled boat powered by twin 115 horsepower Yamaha outboard motors served as the research vessel (Plate 2). The open decked boat with enclosed cab was outfitted with a Raymarine C120 depth finder, digital chart plotter, and rubber raft with a six horsepower motor for shore and stream excursions. Howard Amos served as captain and the crew consisted of first mate Dale Smith, Jr., chief cook and handyperson Muriel Amos and principal researcher Drozda.

The aim of the circumnavigation was to conduct test fishing in a variety of locations (both stream and ocean), to contact fishers in the field and ascertain their success, and to record information

about species caught and their fishing locations. Test areas were predetermined, but actual locations, distances covered and camp sites were largely dependant on weather and tides. Overnight camps were established in sheltered estuaries situated adjacent to intertidal zones (Plate 3). Arrivals and departures at camp sites were carefully planned in accordance with the high slack tides necessary for navigating tidal streams.

Camps were established at five locations, Mekoryuk, *Ingrimiut*, *Nunarrlugarmiut*, *Penacuarmiut* and *Carwarmiut*. Inclement weather, rough seas and a sabotaged fuel cache (at *Tuqsug*) precluded camping and fishing activities on the far west and north coasts of Nunivak where camps were planned. Therefore a single run from *Carwarmiut* to Mekoryuk with one stop at *Tuqsug* was completed in one day.

Plate 3: F/V Cape Corwin at *Ingrimiut*. Taken from the abandoned village site of *Lurlingmiut* (foreground). The rocky and vegetated spit is named *Taprar*, and in the background *Ingrig* (Twin Mountain), June 18, 2006.

Sampling for Pacific cod generally occurred within 1.5 km of shore. Fishing periods lasted approximately one hour, crew members fished by means of single hook jigs with herring bait. Six streams were surveyed by foot reconnaissance. Stream banks were walked from one to five miles and visually inspected for fish, with occasional testing by rod and reel. Clear water shallow estuaries and bays were visually inspected and set nets were employed at two locations (Plate 4).

Throughout the trip observations were recorded in field notebooks, including GPS coordinates of areas fished, times of actual test fishing and descriptions of fish harvested. Upper and lower limits of stream surveys were recorded on a hand held Garmin GPS unit. Digital photographs were taken of natural resources, geographical and cultural features.

Plate 4: Retrieving set net at *Nunarrlugarmiut*. June 20, 2006.

Fish Harvest Surveys

A preliminary survey of commercial halibut fishers' supplemental (subsistence) cod and halibut catch was conducted during June and July 2005. The investigators prepared a tally sheet and a worker at the Nunivak Reindeer and Seafood Products (NRSP) halibut processing facility in Mekoryuk encouraged commercial fishers to record their supplemental catch on the tally sheet (Appendix H). A follow up survey of commercial fishing vessels occurred in the spring and summer of 2006 (see Results, Table 4).

Comprehensive household surveys were conducted in the fall of 2006. One resident of Mekoryuk was employed for a period of one week to go house to house in the village and survey each household; a sample survey form is included in Appendix I. All survey results are reported in the Results section and presented in tabular form in Appendix G.

Literature Review

Literature review focused on a few primary ethnographic resources (e.g., Fienup-Riordan 2000; Griffin 2004; Himmelheber 1993; Lantis 1946; US BIA 1995; VanStone 1989) as well as Eskimo and Aleut dictionaries, federal and state reports and technical papers, and internet searches. Two obscure but relevant government reports concerning Nunivak fisheries (Hout 1966, 1972) were digitally scanned, converted to PDF files and posted on the NPT website (http://www.nunivakisland.org/Cod%20project/library.htm). References to the three primary study species were summarized and are presented as narrative in the Results section.

Cup'ig Terminology

Preikshot and Leer (1998) describe the value of cataloging local terms as a first step in incorporating traditional ecological knowledge into scientific study. The correct identification of fish species was critical in this study, especially considering the unique nature of the Nunivak dialect. Cup'ig has been shown to share lexicon and other linguistic features with several Eskimo-Aleut languages (Fortescue et al. 1994; Jacobson 1984, 1998), as well as a sharp divergence from General Central Yup'ik dialects (Amos and Amos 2003; Jacobson 1984). We found it prudent to not only compile Cup'ig terms (Tables 7-9) but, for specific fish names, to also cross reference them to terms from other Eskimo-Aleut languages and Central Yup'ik dialects (Table 1).

Museum Collections

Project personnel visited the Anchorage Museum in February 2008 and met with the Collections Department Director Walter Van Horn. The visit coincided with the exhibition *Yuungnaqpiallerput (The Way We Genuinely Live) Masterworks of Yup'ik Science and Survival*, which included several items of Nunivak material culture assembled from other museum collections. Exhibit display labels were reviewed (and in some cases corrected) and specific information regarding items was recorded by the museum director. The project director also viewed material collections related to Yup'ik and Cup'ig fishing technology at the University of Alaska's Museum of the North.

Traditional Knowledge Interviews

The primary data sources for the project were the minds and memories of the *Nuniwarmiut* elders. Initially the project investigators developed a list of eight elders as potential candidates available for interviews in the village of Mekoryuk. A few individuals declined interviews, stating they had nothing to say on the topic, and others were unavailable due to poor health; additional potential interviewees were identified as the project progressed. Ultimately 10 elders were tape recorded in eight interview sessions (Appendix C). Six interviews were conducted at the NPT office in Mekoryuk where interruptions and background noises were minimal. One interview was conducted at a residence in Bethel and one interview occurred opportunistically in the midst of the noisy and bustling Native craft fair at the Alaska Federation of Natives 2005 convention in Fairbanks.

The project interviewees ranged in age from 60 to 93 years at the time of interviews (Table 2). All of the *Nuniwarmiut* elders spoke Cup'ig as their first language. Those interviewed in Mekoryuk were first contacted by a Cup'ig speaker, co-project director Amos. Initial contacts were always by telephone, where the general interview concept was explained. Elders were asked if they were willing to share their knowledge and experiences of Pacific cod. Since cod was the primary focus of the study, elders were not questioned about other species during preliminary phone interviews. Potential interviewees were provided with a general framework or idea of what the researchers were interested in learning, and they were given time to think about it; they were active participants in deciding the best time for the interview.

Plate 5: Nunivak Elder Nancy Edwards (center) with NPT staff, following interview. Clockwise from left top, Howard Amos, Prudy Olrun, Muriel Amos, Patricia Williams. December 8, 2005.

Interview Techniques

Interview sessions occurred for the most part in multigenerational settings comprised of respectful and interested listeners; an environment that helped put the narrator at ease and created a sense of sharing, instruction and learning (Plate 5). Interviewers often formally began recording sessions by asking one question relating to the interviewees first memories associated with Pacific cod. From this question the interviewees would begin their narratives. Other times no questions were asked at all, the interviewee would simply launch into his or her narrative, having been briefed and anticipating what was expected of them. In some cases interviewees needed prompting and direct questioning or follow up questioning was the employed technique.

The project investigators worked together to develop a list of specific questions (Appendix D) focused on the three target species. Questions of interest provided by research biologists from the University of Alaska were also incorporated into the plan. Although questions were drafted beforehand the methodology was to not use them to direct the interview, but rather to encourage the interviewees to provide information as a discourse narrative. The interview methods varied and were flexible; driven, at least partially, with consideration of culturally determined rules and discourse style of the information providers.

Table 2: Interviewees, areas of expertise, and estimates of Pacific cod disappearance and return.

Interviewee (by ca birth year)	Primary area discussed. *birthplace	Year cod disappeared (estimated)	Dating method (rationale)	Year cod returned	Dating method (rationale)
Nan Kiokun (1913)	Miqsarmiut*; Nuuteqermiut; Paamiut	1950	Japan fishing fleet present offshore	--	--
George Williams, Sr. (1922)	Miqsarmiut*; Nash Harbor; Qengartaaremiut; Mekoryuk	--	--	--	--
Susie Shavings (1922)	Mekoryuk*; Cape Etolin; Mekoryuk River; Tacirmiut; Mecagmiut; Nunarrlugarmiut	1945 – 1950	Birth of children	1985	Son caught first of returning cod, year known
Henry Shavings (1924 or 1925)	Taprarmiut*; Qavlumiut,	--	--	--	--
Helen Williams (1929)	Mekoryuk (birthplace?)	--	--	--	--
Ida Wesley (1929)	Englullugarmiut*; Cape Mendenhall; Cape Etolin;	1947-1948	Estimated birth year of first child (1947)	--	--
Nancy Edwards (1931)	Nash Harbor*	1950	Marriage	--	--
Joseph David Sr. (1934)	Mekoryuk*	1944-1947	Estimated age: 10–13 years		--
Hilma Shavings (1934 or 35)	Paamiut (Cuqucuryarmiut)*		--	1980s	--
Prudy Olrun (1940)	Mekoryuk*; Mecagmiut; Paamiut; Talungmiut	1946 – 1947	Estimated age 6 or 7 years – memory of last cod until recent times	1985	Year family moved from Bethel to Mekoryuk
Howard Amos (1950)	Nunarrlugarmiut; Mekoryuk	--	--	1985	Commercial herring fishery established

While direct questioning may have been construed as rude or disrespectful in the past, now *Nuniwarmiut* tend toward tolerance of non-natives' questions and accept them as the methods or ways of Western scientific inquiry. Still, interviewers avoided direct questioning as much as possible, giving greater control to the interviewee while allowing all parties to influence the content and direction of the interview (cf. Drozda 1995; Magdanz 2000). When interviewees present narratives on their terms others may better understand those aspects the narrator considers to be most significant, revealing those life experiences which made the largest impression upon them or they considered most important.

No matter the method it is critical to develop a strong and positive relationship between the interviewer and interpreter. Before interviews the interviewer and interpreter worked closely to understand the assumptions, goals and expectations of each other. Together they developed a list of questions that served as a guide and checklist. During interviews information provided by interviewees provoked more questions, which were written down and saved, and (along with any

unanswered questions) asked at the conclusion of the interviewee's primary narrative. Interruption was purposely avoided.

Although some interviewees naturally strayed from the study topic the goal remained to keep the interviews specific. Narratives in general began with a brief biography and residence history (i.e., birthplace, subsistence camps and travels). Interviews focused on Pacific cod – natural history, biology, subsistence use, harvest methods, gear, processing and storage.

All interviews were tape recorded on voice quality Sony TCM 5000 tape decks using an external suspended microphone. One early interview tape developed problems and some narrative was lost. Several attempts were made to repair the tape by both the project directors and later by personnel at the University of Alaska Rasmuson Library Oral History Program. Apparently the tape was defective from the factory with a twist in the tape on the supply reel. This caused the recording of a loud hiss rather than the interview. The tape was destroyed. Subsequent interviews were also recorded on a backup digital voice recorder as insurance. Digital backup recordings were made using a high quality handheld digital voice recorder. The digital recordings were subsequently transferred to hard drive and compact disks.

Interviewees were paid $75.00 per session and individual sessions ranged from one to three hours. Release and consent forms were obtained from each respondent following the interview (Appendix F). Photographs were also taken of elders and some have been posted to the NPT web site (www.nunivakisland.org/photos/photoarchive1.htm).

Plate 6: Nan Kiokun (center) describes aspects of Pacific cod drying and processing as captured in an early 20th century photo. (Clockwise from left) Prudy Olrun, Howard Amos, Muriel Amos and Dorothy Kiokun. June 13, 2005.

Interviewee Methods

Interviewees were informed collaborators on the project, and therefore, it is appropriate to mention some of their ways of delivering information and how orally transmitted information is validated in Nunivak culture. Naturally, the ways in which information is structured and delivered by interviewees is highly individualistic. Consequently, the interpretation and presentation of narratives is a challenging task. One is tempted to provide the written transcription of the oral presentation as close to the spoken word as possible. However, that is typically unrealistic and unattainable given the variety of narrative styles, coupled with the challenges of translation from Cup'ig to English.

Nunivak elders frequently qualify their statements with respect to accuracy and authority. For instance, throughout her narrative Ida Wesley deliberately emphasized that which she personally witnessed or experienced. She repeatedly prefaced sentences or concluded her statements with qualifiers as shown on the following chart (Table 3). Ida articulated at least 31 of these experiential modifiers, one (on average) every 2½ minutes. While most of the statements were removed from the edited summaries, they are important components of Cup'ig oral narrative. Ida focused less on what she did - she removes the attention to herself in culturally appropriate ways - and instead stresses the actions of others (primarily her elders). Thus, her comments add strength to the descriptions and serve to enforce their legitimacy, in addition to establishing or emphasizing the antiquity or duration of particular customs.

Plate 7: Ida Wesley (*Icaran'in*) as a young girl learns the method and art of stringing saffron cod with braided grass from elder Lilly Jones (*Elluwag'ar*). Photograph by Amos Burg, Spring 1941 (Oregon Historical Society, #OrHi95197).

Table 3: Experiential expressions from Ida Wesley's narrative.

English translation	**Category**
"when I was a child I saw …"	witness but not necessarily participate
"I mentioned what I used to see."	witness but not necessarily participate
"I saw my parents do that. Others like my grandfather used to do that as well."	witness but not necessarily participate
"What I observed."	witness but not necessarily participate
"That is how it was done during my observation."	witness but not necessarily participate
"what I have seen was done in that fashion. My father made them like that."	witness but not necessarily participate
"That is how I used to see them."	witness but not necessarily participate
"What I used to see."	witness but not necessarily participate
"That is how they used to do it, for what I observed as a child."	witness but not necessarily participate
"They gathered as much as they could, from what I observed"	witness but not necessarily participate
"as I observed during my childhood."	witness but not necessarily participate
"I have actually seen them there."	witness but not necessarily participate
"That was how it was done when I was a child"	positive expression
"I'm telling you this, because it was practiced a long time ago."	positive expression
"That is how they fished when I was a child."	positive expression
"Our ancestors used to do that."	positive expression
"That is how it was done a long time ago, when I was a child."	positive expression
"That is how it was done in the early days."	positive expression
"Our ancestors used to say"	oral lessons and continuing tradition
"I used to hear as a child."	oral lessons and continuing tradition
"We were told to…"	oral lessons and continuing tradition
"That is how my father taught me."	participation and continuing tradition
"He taught me how to do that."	participation and continuing tradition
"I learned how to do that from my father."	participation and continuing tradition
"when I was young."	first or early memory
"when I became aware of my environment."	first or early memory
"In those days when I was a child"	first or early memory
"When I became aware"	first or early memory
"because I don't go there anymore, I don't know."	negative qualifier
"I do remember, but not sure what year it happened."	negative qualifier
"I used to do that."	direct participation

Issues of Translation and Transcription

Considerable effort was given toward processing oral history tapes. Similar projects have found the practice of translation and transcription (when done properly) to be time consuming and costly. LaVine et al. (2007:90) estimated 100 hours were necessary for full transcription, review and editing of one interview tape. This figure is reasonable or conservative, depending upon a number of factors such as audio and narrative quality, difficulty of dialect or the amount of Native language on the tape. This project required a range of 61 – 145 hours for the complete processing of one sixty- minute interview tape. This figure does not necessarily include summarizing, indexing or full analysis of transcripts.

For the researcher access to primary oral data, especially when presented in a Native language, is often limited; for this reason a concerted effort was made to provide access in a number of processed formats. Information from interviews is limited to the topic of fish in this report, while comprehensive summaries including other topics are presented on the NPT website (www.nunivakisland.org). Additionally, full bilingual transcripts as well as audio tapes were deposited and are accessible at the UAF Archives. The investigators on this project believe the information on the tapes is practical and useful to a wide range of scholars. Relatively open access to raw and processed interview data facilitates informed critique of interpretations presented in this report and also honors those who provided the information by making their knowledge accessible to future generations.

Transcript Methodologies and Interpretations

The process of transforming the spoken words of the elders to print goes far beyond the simple transcription of a tape-recorded interview. Interview tapes were transcribed and transcripts summarized according to a four-step process with some variation as follows:

1. Initial transcription of Native language (preferably by the interview interpreter).
2. Translation.
3. Review/edit of bilingual transcript.
4. Summarize transcript.

The translator (who, importantly, was also an interviewer/interpreter for most of the interviews) began the transcription process by fully transcribing the Cup'ig language. Working with a transcribing machine and a word processor a typical 60-minute interview would result in roughly 30 pages (double spaced) of Native language text. Depending upon the difficulty of the tape (sound quality and other nuances) this could take several days to accomplish.

Next, Native language text was translated to English, a process adding several more days to the project. In rare cases and at the discretion of the translator, some potentially offensive or otherwise inappropriate language may not be translated. Interviews also revealed words that were unfamiliar to the interpreters and translators; in these instances a village elder was consulted in order to ascertain the meaning of the word and develop an appropriate English translation.

The completed bilingual transcript was reviewed by the translator/transcriber, or ideally by another versed in the language, before delivery to the interviewer (Project Director). This individual, with limited knowledge of the lexicon, orthography and grammatical structure of the Native language, would review the bilingual transcript, make corrections to the English, and identify questions for the

translator regarding particular translations, words or passages. So at this stage there may be a bit of back and forth communication to clarify and tighten the texts.

Next, English translations were separated out and in some cases reorganized and edited for a predominantly English literate audience. Parenthetical explanations and footnotes to clarify or enhance text were occasionally added. The entire process from tape to useful, accurate interpretation could consume 150 hours or more.

Orally presented data often require interpretation when converting to print record. The process of developing, editing and distilling tape-recorded oral histories is fragmentary in nature and destroys some of the sense of the interview that printed words alone cannot capture. Issues of translation among Yup'ik and Cup'ig specifically and Native Americans in general are addressed in a number of other works, including Fienup-Riordan and Kaplan (2007), Hymes (2002), Morrow and Schneider (1995) and Tedlock (1983).

In this report statements are presented relative to a narrow topic while full bilingual transcriptions, comprehensive summaries and original tapes may be accessed via the NPT website and in local and state archives; it is important that these materials remain accessible for other scholarly work, interpretation of data and future generations.

Interview Method Examples

Since narratives in this report have been rearranged, condensed and are presented primarily in English, included below is an example of a typical bilingual exchange occurring at the start of a session. The reader should bear in mind that the interviewee was briefed prior to the interview and given time to think about the topic. While each interview was different the example is a fair illustration of the interview process and in-context articulation of the narrator.

> Interviewer (R. Drozda): Maybe first question would be, I'm just wondering Susie what your first memories are of fishing for cod-*atgiiyar*? And where you were fishing, if you were with your parents, those kinds of things.
>
> Interpreter (H. Amos): Uumeg apcugg'aten. Enqaktacirpet-ggur anglillerpeni makuneg atgissaullinillrianeg qanesqumaten. Tan'guraullerpeneg ayagluku enqaktacirpet piyugturallerpetun pim'ara.
>
> *<He wants to ask you this question. As much as you can remember when you were growing up, he would like you to talk about Pacific cod. Beginning with your childhood, as much as you can remember you may talk about it in any fashion you desire.>*
>
> Interviewee (S. Shavings): Tan'gurraulua kua maani Mikuryarmiuni ellangellrungama, tan'gurraullemini. Ukut Mikuryarmiut ellangutkellrungamki nunakluki, tawaten ellangellrunga. Nut'an-llu uksurpag uksiurararluteng kuaten Mikuryarmiuni kuani upagnarriaqateng move-arluteng waawet, seal camp-arnun ugkunun Pengurpagmiunun.
>
> *<As a child, I came to my environmental senses here at Mekoryuk, when I was a child. Mekoryuk was where I sensed my environment and that is how it was. Then after the people of Mekoryuk spent their winters here and it*

came time to relocate they moved out there, a seal camp called Pengurpagmiut.>

Tawani move-arluteng tallu kiapaurpag wiitaureluteng. Taqukaneg pissullrit pitquluteng, angucalluait, angutet. Qayartuquluteng unawet angyaatellermegni caknerluteng pit'allrut. Qayameg-kes aturturluteng. Tawaten piurararluteng tamakuneg kiagaqan waani it'erpeknateng tall'u atgiyanun egmirluteng. Atgiyinaluteng cal'i. Atgiyiluteng iqsagnarikan qayartuareluteng iqsagyarnaurtut tan'gurraullemni, kwiinga elpeklemni.

<They moved and stayed for the remainder of the spring season. The men, whom hunted for seals do catch some. They used kayaks when open boats were not available; it was a very difficult time. They only used kayaks. After doing that for some time, when summer arrived they remained at (Pengurpagmiut) without returning to (Mekoryuk), they then started fishing for Pacific cod. Their intent (to remain there) was to fish for Pacific cod. When time came to jig for Pacific cod, kayaks were used to go jigging when I was a child. At the time I was aware of my environment.>

Tayima nultarararluteng unani imarpigmi ketvarluteng qayat nultarerluteng piurararluteng tagaqluteng atgiyaneg-llu unangliniluteng uc'irluteng qayateng ellmallinikunegteki atgiyaneg. Uc'irarluteng taquneng tallu kenilitqerluki, ken'iulluki tamakut iqsallreteng, nerevkarrarluki tawaken atgiyartait illaitneg, egateqerluk'i.

<When they went out to the ocean, the kayaks stayed out for quite a while. They returned with a kayak full of Pacific cod, they then unloaded. After unloading, Pacific cod was prepared and cooked for them.> (Shavings 2005)

While interview participants sometimes strayed from the study topic all worked to keep the interviews focused; overall the interviews were specific and productive. Often the degree to which the interview strayed was at the discretion of the interviewee, the interpreter, the interviewer or some combination of the three. Naturally, narrators organize their thoughts differently or some may grasp the purposes of interviews better than others. In the following example the interviewee suggests a digression and the interpreter encourages her to speak somewhat off of the main topic:

Interviewee: Taugg'am mac'utameg apeskanga answer-aryugngaqa tauna mac'ut'ar. *<Although if he (interviewer) asked me about dog salmon I am well capable of answering that.>*

Interpreter: Qanrulluku! Mac'utarmeg. *<Go ahead and tell him about dog salmon!>*

A second example demonstrates the interpreter and interviewer bringing the interviewee back to the primary topic:

Interpreter: She was just relating various rituals (not associated with codfish). Any other questions?

Interviewer: Yeah, I wonder if when the cod disappeared like that, if that created hardships and how they, how did they adjust…?

In the first example the interviewee understands she is expected to speak primarily about cod fish. The interpreter, knowing the study parameters and the expectations of the interviewer enthusiastically encourages the interviewee to continue speaking on the ancillary topic of chum (dog) salmon. The second example includes verbal and non-verbal cues expressed by the interpreter to the interviewer. Rather than fully interpret or elaborate on the "various rituals," the interpreter instead asks the interviewer for new questions to bring the interview back to the primary topic. Participants realized that certain memories and topics, especially those involving obscure information, long-abandoned practices, and certain lexical items were worth exploring. The samples presented above are not given as "methods" which can or should be duplicated; rather they are examples indicative of the benefits of developing strong interviewer-interpreter-interviewee relationships prior to interviewing sessions.

III. RESULTS - SURVEYS

The project included three types of surveys conducted over two years: i) a survey of commercial halibut fisher's supplemental catch (2005, 2006); ii) household subsistence fishing survey (2006); and iii) stream and offshore tests (2006).

Plate 8: Pacific cod on deck of Henry Ivanoff's boat, June 18, 2006.

Commercial Halibut Fishers Survey – June and July 2005

Commercial halibut fishers were surveyed as they delivered their catch to the Nunivak Reindeer and Seafood Processing facility in Mekoryuk. Thirty fishermen reported catches of 193 halibut, 156 cod, and 12 of three other species – sablefish (black cod), pollock and sculpin - from June 15 to July 22, 2005. The maximum number of Pacific cod caught by one fisher in one day was 34 fish. This

was recognized as a significant catch and it drew the attention of many in the village of Mekoryuk, but it was not included on NRSP tally sheets (Appendix I). Therefore, the total recorded number of Pacific cod caught and kept for subsistence purposes in 2005 was actually 190 fish. This number is a minimum estimate derived from a limited survey and does not include fish caught at summer camps and other unreported catches by local commercial halibut fishers. The number could be considerably higher.

Plate 9: Pacific cod taken off of southeast coast of Nunivak Island, June 18, 2006.

Commercial Halibut Vessel Survey - June 2006.

A commercial vessel survey included boats fishing the offshore waters from the vicinity of Cape Corwin to *Nunarrlugarmiut* from June 12 to June 26 (Table 4). All fishermen used handlines and longline gear. Eight vessels participated in the survey. A total of 110 Pacific cod were caught. All but 18 of the cod were caught between June 12 and June 18. The remainders were caught by one vessel on June 26, 2006. The survey was conducted by James Whitman of Mekoryuk and participation was voluntary.

Table 4: Commercial halibut fishers' supplemental (subsistence) cod catch, June 2006.

Vessel	Captain	Pacific Cod Catch
Robert Todd	James Whitman	15
Coleman "C"	Chester Wesley	2
C Pat	Solomon Williams	20
Melissa Marie	Sam Shavings	29
Captain Dawn	Ken Davis	10
My Two Nussans	Ishmael Smith	15
Jessica Sea*	Henry Ivanoff	14
*	Dan Olrun Jr.	5
* name uncertain	Total cod catch	110

Household Survey – 2006

All 27 Mekoryuk subsistence fishing households were surveyed between July 27 and August 1, 2006. Households consisted of 128 family members with an average household size of 4.75 members. Active subsistence households accounted for 59% of the reported individual population of Mekoryuk.

A minimum of eight campsites (some used by multiple households) and approximately 25 areas or streams were identified as fishing locations by respondents. Camps were established beginning in late June and saw continued use through the month of July. Camping occurred primarily for procurement of chum salmon, but some sites were specifically associated with Pacific cod fishing. Cod fishing also occurred in the vicinity of chum salmon camps and opportunistically during slack times or while salmon dried on racks. Survey results are presented in Appendix F and summarized in Table 5.

Table 5: Summary of 2006 household subsistence survey (assessment of harvest from fall 2005 to August 2006).

Households/ occupants	Fish Camps Identified (# of households reported)	Fishing sites by name/area (# of households reported)	Total Fish reported	Subsistence fish goal met
27 / 128	Emnerermiut (2) Iwerwigmiut (1) Mekoryuk River (4) Negermiut (2) Nunarrlugarmiut (8) Paamiut (3) Qengartaaremiut (2) Talungmiut (1) 23 designated a camp 4 undeclared (fished, but did not camp)	Aqitur (1) Below airport (3) Bering Sea (21) Cape Etolin (3) Iqangmiut (3) Iwerwigmiut (2) Kotzebue (1) Kuigaaremiut (3) Kuigglugar (3) Kuigglugarmiut (3) Main River at Nunarrlugarmiut (1) Mecagmiut Kuigat (river) Mecagmiut Taciat (bay) (1) Mekoryuk River (25) Negermiut Kuigat (1) Nelson Island (8) Negermiut (2) North Mekoryuk (1) Nunarrlugarmiut (4) Paamiut River (3) Qanitar (1) Qayigyalegmiut (1) Qengartaaremiut (1) Southside (1) Tacirmiut Kuigat (2) Tacirrarmiut (1) Talungmiut (1) West Nunivak (1)	4188 Chum 541 Pink 18 Sockeye 3 Chinook 1 “unidentified salmon” 1405 Saffron Cod 1260 Herring 278 Halibut 260 Pacific cod 6 Flounder 0 Grayling	yes – 22 no – 4 no response - 1

In summary, members of 23 households camped in at least eight different sites. Four households reported they did not camp, but fished close to their home base at Mekoryuk. Eight respondents reported fishing (not exclusively) in the vicinity of Nelson Island, primarily for herring. One respondent fished outside of the region near Kotzebue. Twenty-five households reported at least one member fished in the Mekoryuk River, primarily for saffron cod. Twenty one fished the Bering Sea for Pacific cod and halibut and reported nearly a 1:1 ratio of cod to halibut. Only one fisher specifically targeted grayling, at the river of *Qayigyalegmiut*.

Several “fishing sites” identified on survey forms refer to general areas. For example the area identified “below airport” describes a section of coastline from *Ataatagguar* to *Qikunguarat*. Both places are easily accessible by ATV (4-wheeler) from Mekoryuk. Another “below the airport” spot is beyond an area also referred to elsewhere as “the cape,” probably *Nanwarrlim Cingia*, at *Naparyaleg* (USGS Nabaksyalik Pt.). Residents fish these areas using gill nets anchored to shore. The nets have a mesh size of 7.0 – 7.6 cm (2¾ - 3 inches). “Bering Sea” was not further delineated; it was most often given by halibut and Pacific cod fishers. “Cape Etolin” most likely refers to locations in the sea as much as one mile off of the coast of the cape.

Nearly every surveyed household identified the Mekoryuk River as a fishing site. Most of these replies refer to the taking of saffron cod (*Eleginus gracilis*, “tomcod,” *iqalluar*) caught primarily through the ice in estuaries and river mouths. With respect to saffron cod fishing, Mekoryuk River is more accurately described as *Mikuryarmiut Taciat* (USGS Shoal Bay), the lower tidally affected reaches of the river. Further upstream residents set nets for chum salmon and at least two campsites (unidentified by name) were occupied in 2006.

Field Surveys

A preliminary boat trip in June 2005 resulted in a coastal traverse and visual survey of approximately one-quarter of the island shoreline (Mekoryuk – *Nunarrlugarmiut*). Project personnel tested field equipment (e.g., boats, radar, GPS, cameras), and photographed island geography, wildlife, historical sites and fish camps. Test fishing did not occur during the preliminary trip. Campers were noted, but not contacted at several locations, including *Qaneryagtalegmiut*, *Paamiut* and *Nunarrlugarmiut*. The trip resulted in the photo documentation of prominent geographic features, historical sites and contemporary fish camps. Visual surveys were conducted at several sites to ascertain channel locations and identify potential landing spots for future visits.

Plate 10: Red salmon, 61 cm. long, caught by hand (without equipment) near the mouth of *Cingillret Kuigat*, southwest Nunivak, June 24, 2006.

Ocean and Stream Sampling

Full circumnavigation of the island occurred from June 18 through June 25, 2006. Test fishing took place both offshore and in stream-estuary systems. The tests resulted in documentation of Pacific cod, halibut, flounder, sculpin, stickleback and red salmon. GPS coordinates were recorded for test areas; sea floor depth and precise beginning and ending coordinates were recorded in offshore testing areas.

Foot surveys of streams included GPS tracked routes and visual observations. The results of surveys covering 10 pelagic tests, five reports from field encounters with subsistence fishers, two estuarial set net tests and six pedestrian visual stream surveys are summarized in Appendix G.

Plate 11: Dale Smith, Jr. displays Pacific cod caught in Etolin Strait, June 18, 2006.

Environmental Changes

The southern coast of Nunivak Island received frequent and intense storm activity during the winter of 2005-06. The project survey recorded the mouth of Chakwakamiut River (*Carwarmiut Kuigat*) had moved approximately one mile east between fall 2005 and summer 2006. Dunes indicated on the USGS map have been completely removed and the principal investigators recorded the mouth of the river nearly merged with that of the small stream Jayalik River (*Cayaleg*) to the east (Figures 4

and 5). Portions of the historical site *Carwarmiut* (and perhaps other south coast archeological resources) are at risk of loss due to erosion.

Figure 4: *Carwarmiut Taciat* (Estuary), Google Earth satellite image, ca. 2006.

Figure 5: *Carwarmiut Taciat* (Estuary), USGS 1:63,360 base map, based on aerial photos 1950 and 1952.

IV. INCONSISTENCIES IN THE FISH LEXICON

Inconsistencies in use of English common names, unfamiliarity with Nunivak terminology - both English and Native language – and significant (and in some cases previously overlooked) differences between Cup'ig and mainland Central Yup'ik dialects may all lead to confusion or errors when discussing or researching fish species among the *Nuniwarmiut*. In some cases these kinds of errors have worked their way into the literature.

A most pertinent example exists in the various terms for Pacific cod. While it is clear that "*atgiiyar*" is Cup'ig for "Pacific cod (*Gadus macrocephalus*)," the Cup'ig Eskimo Dictionary (Amos and Amos 2003:51) does not identify the fish by either the standard English common name or the scientific name. Instead the dictionary contains the variants (not necessarily incorrect) "Arctic or gray cod." This study revealed that among contemporary *Nuniwarmiut* these English common names are now used synonymously with "Pacific cod," "P-cod" or simply "cod."

Misunderstandings involving Native names, common names and scientific terminology may be exacerbated when consulting or relying on primary reference works. The Yup'ik Eskimo Dictionary (YED, Jacobson 1984:89) identifies "*atgiiyaq*" (here written in standard Yup'ik orthography) as Nunivak dialect (NUN) for "Arctic cod (*Microgadus proximus*)." While "Arctic cod" accurately reflects English use (of some) at Nunivak, the inclusion of the Linnaean name in the YED is clearly an error.

In other Yup'ik areas of western Alaska *Microgadus proximus* is referred to by the common name "Pacific tomcod" or simply "tomcod" (cf. LaVine et al. 2007). However, Pacific tomcod apparently do not occur, or occur infrequently at Nunivak. Among the *Nuniwarmiut* the English term "tomcod" refers exclusively to saffron cod (*Elginus gracilis*), in the Cup'ig language "*iqalluar*."

"*Iqalluar*" is also a Cup'ig general term for "fish," indicating the significance of saffron cod as a staple food resource. Cup'ig is distinct from all Central Yup'ik dialects in its generic use of "*iqalluar*" to designate fish. The YED also mistakes "*iqalluaq*" as Nunivak dialect for "Arctic cod (*Microgadus proximus*)" and *iqalluk* (Central Yup'ik for chum salmon) as the Nunivak generic term for "fish." These discrepancies (and others) may appear a bit clearer by studying Table 1 which presents the Cup'ig names of 37 species recognized by *Nuniwarmiut* cross referenced to other Eskimo-Aleut languages, common and scientific names.

The above examples also provide evidence of the strong divergence of Cup'ig from Central Yup'ik dialects (including the Cup'ik of Chevak), and the confusion that may arise in studies of environmental resources that are conducted in two or more languages. Interestingly, the Aleut cognate of Cup'ig "*atgiiyar"* is "*atxidax̂* (Bergsland 1994:110; Jacobson 1984:89), identified by Bergsland as *Gadus macrocephalus* (i.e., Pacific cod). This in turn is a good example of one shared phonetic feature of Cup'ig and Aleut (Unangam) - the devoicing of final fricatives, a trait not shared between Nunivak and the other Yup'ik dialects (Jacobson 1984:36).

This project led to the development of a fish and marine resources database in MS Access compiled from 15 historical and contemporary sources for four Yupik languages (including major dialects)

and Aleut. Currently, 156 Cup'ig language terms have been identified, tabulated and cross referenced to other Bering Sea languages and entered into the data file. Interviews also revealed several previously unrecorded Cup'ig terms. Tables 1, 7, 8 and 9 (fish names, glossaries of fish related terms, anatomy, fishing technology and processing) are derived from the database.

V. RESULTS – LITERATURE

There are few references in the published literature to the traditional harvest of cod at Nunivak Island. The species is not clearly identified in the historical literature; when "cod" is discussed Pacific cod (*Gadus macrocephalus*) is assumed, however the name (cod) also may have been used generically to include other species such as pollock (*Theragra chalcogramma*) or Arctic cod (*Microgadus proximus*). The presentation below is focused specifically on Pacific cod and relevant statements to fishing in general. Summaries of the contact history of Nunivak may be found in the Bureau of Indian Affairs Nunivak Overview (US BIA 1995[1]) and in Griffin (2004).

19th Century

The first recorded contacts with *Nuniwarmiut* at Nunivak Island came in 1821 and 1822 by the Russians Vasilev, Etolin and Khromchenko. The explorations of Khromchenko and Etolin were summarized by the Russian historian Petr Tikhmenev who wrote of the *Nuniwarmiut*:

> Their main occupation is hunting large hair seals, or makliaki, walrus, and caribou, and catching fish offshore (Tikhmenev 1978:437).

According to Khromchenko's journal (VanStone 1973) he and Etolin visited Cape Mendenhall and Cape Corwin in June 1822. It would have been a peak time to witness the residents "catching fish offshore" at locations contemporary Nunivak elders count among the most historically productive Pacific cod fishing grounds at the island.

In early June, prior to their arrival at Nunivak and at least 200 km (124 miles) south (between Cape Newenham and the Pribilof Islands), Khromchenko noted:

> Every day we caught cod by hook and line; in fact we encountered cod quite often here. Some of them were quite large and none was smaller than 25 to 30 pounds [11.3 – 13.6 kg.] (VanStone 1973:57).

By mid-month they approached Nunivak Island in the fog:

> We reckoned we were quite close to Nunivak…in depths of 23 to 18 sazhens [49 – 38 meters], often heaving to. The crew spent the whole day catching cod, which appeared here very often, and we caught so many that I ordered the surplus to be salted in a special barrel.

When the fog lifted on the morning of June 17 the island was sighted approximately 19 to 24 km (12 to 15 miles) to the north. The ocean depth was measured at 17.5 sazhens (37 meters) and the bottom was described as sandy. Khromchenko and Etolin did not go ashore at Nunivak until they reached the southeastern village of "Chinik" (*Cingigmiut*). Kromchenko's observations, however, contain no mention of subsistence activities or cod fishing by the *Nuniwarmiut*.

The next known contact was over 50 years later by W.H. Dall, in the summer of 1874 (Griffin 2004:12; US BIA 1995[1]:12). Dall provided little ethnographic information on the *Nuniwarmiut* (Griffin 1999: 177; US BIA 1995[1]:12), however, he did survey and produce a detailed chart of the Cape Etolin area (Figure 6). While the exact dates of his survey are uncertain, and he may have arrived too late in the season to witness cod fishing activities at Cape Etolin, it is curious the prominent 20th century Pacific cod fishing and seal hunting camp of *Pengurpagmiut* - described by later ethnographers E. S. Curtis (1927) and M. Lantis (1939-40) as well as contemporary Nunivak elders (1986-present) - is absent from his map. The Dall map does mark a "village" at the current site of Mekoryuk and another "winter village" (presumably *Unguliwigmiut*) near Cape Etolin.

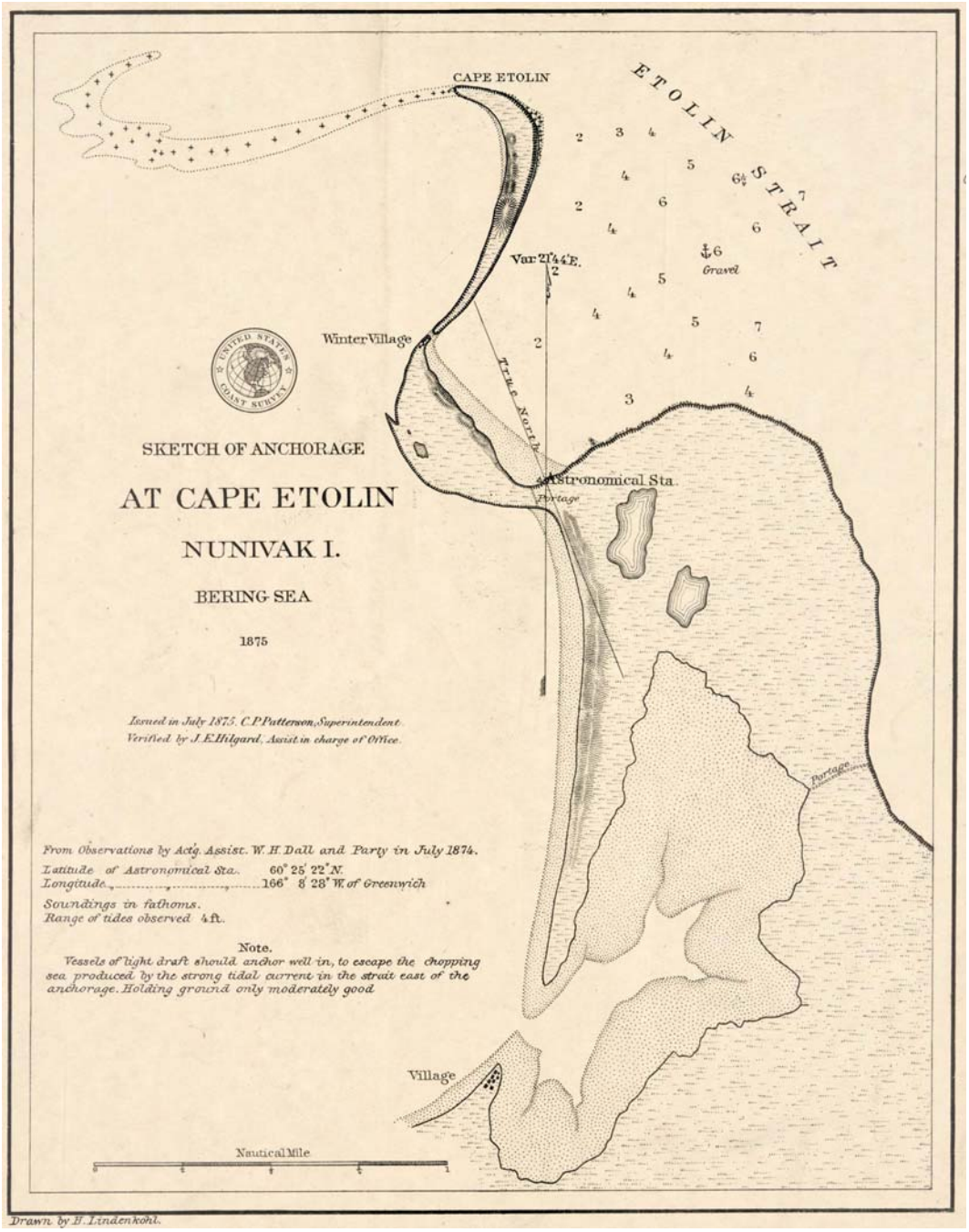

Figure 6: W.H. Dall Map. Issued July 1875 (University of Alaska, Rasmuson Library Archives).

20th Century

In 1924 Danish explorer Knud Rasmussen made contact with *Nuniwarmiut* in Nome. Included in Rasmussen's report (Ostermann 1952:282) are "Ethnographic Details" by Paol (Paul) Ivanoff, a trader of mixed Russian and Eskimo descent who spent several previous years at Nunivak. Ivanoff recorded the names of months based on the lunar calendar including, "July. Tingmiayakut Tingutut" (cf. "*Tengmiarat Tengutit*, June, in Amos and Amos 2003:321); he wrote,

> This month is for fishing codfish with couple kiaks [Rasmussen footnote: 'tied together']. Fishing of different fishes is being done both with lines and hook. Drying exclusively…. Navigating with boats is being done to different villages.

A few years later (1927) E. S. Curtis also recorded the names of "the twelve seasons of the Nunivak year," and wrote the month as "Tinmeyakat-tinutit-tanoket" (here lacking diacritical marks). He associated it with June rather than July and wrote, "The latter part of the season is occupied with cod, salmon and trout fishing" (Curtis 1930:47). Lantis (1946:171), Jacobson (1984:670) and Amos and Amos (2003) all correlate the month to June. In describing the "seasons" Curtis delineated the period corresponding to March as the time people left their winter villages for spring fishing camps (Curtis 1930:47).

Curtis also captured the photographic image of large quantities of split cod drying on rocks (Plate 33), presumably at *Pengurpagmiut*, a place he described as "a spring (April – June) fishing village." He further described cod fishing as follows:

> In the early summer, cod are caught on hand-lines. The women pack the catch to a suitable spot and there clean the fish. The heads minus eyes, are split open, as are the cleaned bodies and both are spread out on rocks near the shore to dry. After the sun curing, bodies and heads separately are strung on lines and stored in houses. At the same time as the cod catch, or shortly after, appear the smelt, which are caught in dip-nets (Curtis 1930:35).

Curtis indicated "blackfish, bullheads, dogfish, flounder, halibut, herring, freshwater sardine (stickleback?) and whitefish" were also caught, but in fewer numbers than cod, smelt, salmon and trout (Curtis 1930:35).

Henry Collins, on Nunivak near or at the same time as Curtis, recalled an evening (June 23, 1927) of cod fishing at Nash Harbor (*Ellikarrmiut*):

> After supper we went cod fishing with Mr. and Mrs. Bird [the island's first school teachers] just outside the western point of the harbor. Caught 3. Mr. Bird two and I one, averaging about 10 pounds. These are the first cod that have been caught this season. Not much sport to it. Can hardly feel them bite and they make no resistance whatever in coming up. Got back about 11 p.m. (Collins 1927:18).

"Just outside the western point of the harbor" is open to interpretation. One might conclude this to mean the northernmost tip of Cape Algonquin (*Qerrirlit*). In any case the statement coincides with those made by Nunivak elder Nancy Edwards that the men fished just out of sight of the village, to the west, below the place named *Qerrumalˀria*. Collins, an archeologist, makes no mention of the Native harvest and use of Pacific cod.

The period 1923-1927 marked the arrival and stay of the first school teachers at Nunivak Island, the Birds' mentioned above by Collins. Photos from Irving Bird taken during that period include subsistence activities and Pacific cod fishing in the vicinity of Nash Harbor. Griffin (2004:153) included one photo (ca. 1926), identifying Nunivaker John Jones with a day's catch of whole cod on the beach, with an open boat, *angyar*, in the background (Plate 12). There are well over 50 Pacific cod in the photograph and several of them appear to be quite large.

Plate 12: John Jones with day's catch of Pacific cod at Nash Harbor, ca. 1926. Irving Bird photo courtesy of Joann Arnall Boston.

Published works by Margaret Lantis (1946, 1960) contain several references to cod at Nunivak, although her emphasis was not subsistence or material culture. The earliest Native account of cod fishing at Nunivak comes from her informant, "Daniel," in 1946 recognized as the oldest man on the island, whose memory extended back possibly to the 1860s (Lantis 1960:vi, 3). Daniel was born at *Tacirarrmiut* and also lived at *Miqsarmiut* "for a long time" (Lantis 1960:17), but continued to move ("usually") to *Tacirarrmiut* each spring. He recalled one early spring (he was a young man, ca. 1880), there was still ice on the sea and:

> some of the men …went out fishing for cod and got lots. That was the first fresh fish of the season (Lantis 1960:17).

On the subject of fish in general, Lantis (1946:158) reported:

> The standby of the year was tomcod. However, satisfying quantities of salmon, trout, herring, cod, halibut and lesser fish were caught, too.

She provided no specific numbers to indicate which species of fish were most abundant. One might assume they are listed in order of importance or quantity. Later, Lantis (1984:209) wrote:

> The fish most exploited were salmon, char (Dolly Varden), cod, halibut, flounder, needlefish (stickleback) and, especially in winter, tomcod. There were some herring.

The reduced status of herring in the second list, taken with the statements of others (including interviewees on this project) points to a lack of documentation, confusion in positive identification, or wide fluctuations in availability of that species as well.

Lantis placed no emphasis on the harvest of Pacific cod or its importance in the diet of the *Nuniwarmiut*. She described the fishing cycle at Mekoryuk and Cape Etolin (Table 6) as witnessed in 1940 (Lantis 1946:174-180). At Cape Etolin cod fishing began in mid-May, she recorded the first was caught there on May 13. Cod fishing was interrupted at month's end when "a strong northwest wind kept the men from going out on the open sea to the codfish banks." Fishing resumed during the first week of June, but she reported both cod and halibut were scarce in 1940, with a ratio of about four or five cod per one halibut at Cape Etolin.

Table 6: Mekoryuk – Cape Etolin fish cycle, ca. 1940. From Lantis (1946).

Date/Season	Species	Place(s)	Quantity	Notes
January - February	tomcod (presumably saffron cod)	Mekoryuk Bay (Shoal Bay)	"not abundant"	"In winter only small tomcods were caught, half the size of the big ones caught in the autumn runs."
March (mid-month)	-	Mekoryuk		"Everyone had plenty of fish" [presumably saffron cod and last year's dried fish].
May 4	herring	Tununak (Nelson Island)		first big run of season
May 6-11	herring	Cape Etolin		first run, "a small one."
May 13	Pacific cod	Cape Etolin		first codfish
May 18	Dolly Varden	Mekoryuk River (?)		first trout
May (last week)	Pacific cod	Cape Etolin	0	"strong northwest wind kept the men from going out on the open sea to the codfish banks"
May 25	salmon	Mekoryuk River	"not many"	first salmon, "there were not many fish of any kind around Nunivak at this time"
June 5-6	chum salmon, herring, sculpin, stickleback (?)	Mekoryuk River		"people began catching…by seine" among the busiest times for the Mikuryarmiut
	Pacific cod, halibut	Cape Etolin	4-5 cod per 1 halibut	"codfish were scarce this year" "This early in the season, fish of all varieties were dried; none was put in pits."
Mid June – early July	chum salmon, pink salmon, Dolly Varden, Arctic char(?), flounder, sculpin, tomcod	Mekoryuk River	many	"One setting of the seine, that is, one tide, would bring in from thirty to forty large salmon."
	Pacific cod, halibut	Cape Etolin		
August	chum and pink salmon	Mekoryuk River		first week of August the last family returned to take advantage of the salmon runs.
September	silver salmon	Mekoryuk River		
September (mid)	flounder, tomcod, sculpin	Mekoryuk River		
October - March	tomcod	Mekoryuk River	"plentiful"	"spawning"

Cod fishing at the time may have been poor throughout northeast Nunivak, from Cape Etolin to Cape Manning. Lantis specifically mentioned one family returning early from cod fishing at *Englullrarmiut* (Cape Manning area) because of the lack of fish.

Lantis stated the early season catch of cod was all dried; none were put in pits, as were salmon later in the season. Course mats of grass were used to cover the fish (Plate 13). She further described the first week of June as among the busiest times for the *Mikuryarmiut* with families returning to Mekoryuk from spring camps in order to pursue salmon in the river while others moved away to fish camps on the southeast side of the island.

Plate 13: Woven grass mats (*umrat'et*, fish covers), protect drying fish at Nunivak Island (E.S. Curtis Photograph, courtesy of Jim Graybill, in NPT collection).

In early June residents began catching what Lantis called "large red salmon (dog salmon)" as well as herring and sculpin by seine in the Mekoryuk River. Her reference to "dog salmon" indicates these were probably chum and not sockeye salmon. By the second half of June and early into July cod and halibut became more abundant; she observed the men employed two umiaks and four power boats to pursue them. Lantis reported throughout July "the river was the center of interest." By the first week of August the last family had returned to take advantage of the Mekoryuk River salmon runs.

Lantis (1946:245) observed that women were expected to gather the fish, shellfish, greens and berries that made up nearly half the *Nuniwarmiut* diet. Older children typically gathered mussels, but regarding the division of labor she said:

> For many tasks there was no hard and fast rule. Men secured codfish and halibut with large composite hook and line [Figure 7], fishing on the open sea. Women and children fished for tomcods [probably saffron cod] and other small fish from rocks along river or bay, using small hooks. Boys fished from kayaks in these protected waters. Women and girls speared tomcods through the ice on river or bay.

Contemporary *Nuniwarmiut* report saffron cod are no longer taken by spear.

Material Culture

Lantis (1946:173) explained some of the fishing technology associated with cod:

> Nuniwagamiut had fishhooks. Large composite hooks were used for cod, halibut, and wolf fish. Similar small composite hooks were used for trout, tomcods, etc. However, for all small fish up to and including salmon, the people preferred nets in summer, spears in winter.

VanStone (1989) described the *Nuniwarmiut* material culture, including fishing technologies, drawing primarily from Lantis's field notes. He called "codfish" a spring and summer resource, and provided a description of the gear used to obtain them:

> For taking codfish and halibut from a kayak, a hook with a large shank made of walrus rib or ivory – with an ivory, later iron, barb – was used with sealskin line and a flat stone sinker. The heavy shank served as a handle which the fisherman could grasp to pull the hook out… Hooks for codfish were also employed in pairs separated by a curved antler spreader. A round stone sinker hung in the center between the two hooks (VanStone 1989:13).

Figure 7 represents an illustration of the paired hook apparatus and Plates 16 and 35 show examples of sinkers like those described by VanStone. Hout (1966:5) mentioned sinkers were also made of bone. One Nunivak hook assembly in the collection of the Peabody museum, collected in 1952 (Fienup-Riordan 2007:273), incorporates a bone sinker. Bone weights were likely made of walrus jawbone, readily available to the *Nuniwarmiut*. Walrus jawbones are extremely dense and sinkers made of them were commonly used by Yupik peoples (A. Linn, personal communication).

Vanstone (1989:30-31) stated the *Nuniwarmiut* processed cod by cutting the fish along the back in the same manner as salmon. The heads were separated from the bodies, split open and the eyes were removed (Plates 42, 43). The heads and gutted bodies were "spread on the rocks to dry and then strung on lines and stored" (cf. Curtis 1930:35). VanStone also reported that sometimes the dry fish was soaked in fresh water in order to soften them prior to eating raw with oil.

E.W. Nelson (1899) did not visit Nunivak, but did acquire items of material culture originating from the *Nuniwarmiut* (Griffin 1999:178). Among these items (in the collections of the Smithsonian Institution) is a hook identified by Fitzhugh and Kaplan (1982:96) as a "large hook… cod hook (14.5 cm long)" composed of a fossil ivory shank with feather quill, a leader loop of thick baleen, sinew lashings and an imbedded sharpened metal hook" (pictured and described in Fitzhugh and Kaplan 1982:96).

In their work Pacific cod is not specifically mentioned and is conspicuously absent from a table listing 21 species of "Fish Utilized by the Eskimos of the Yukon-Kuskokwim Delta-Norton Sound Region" (Fitzhugh and Kaplan 1982:47), a list adapted in part from Nelson's observations in Alaska (cf. Nelson 1884, 1887, 1899).

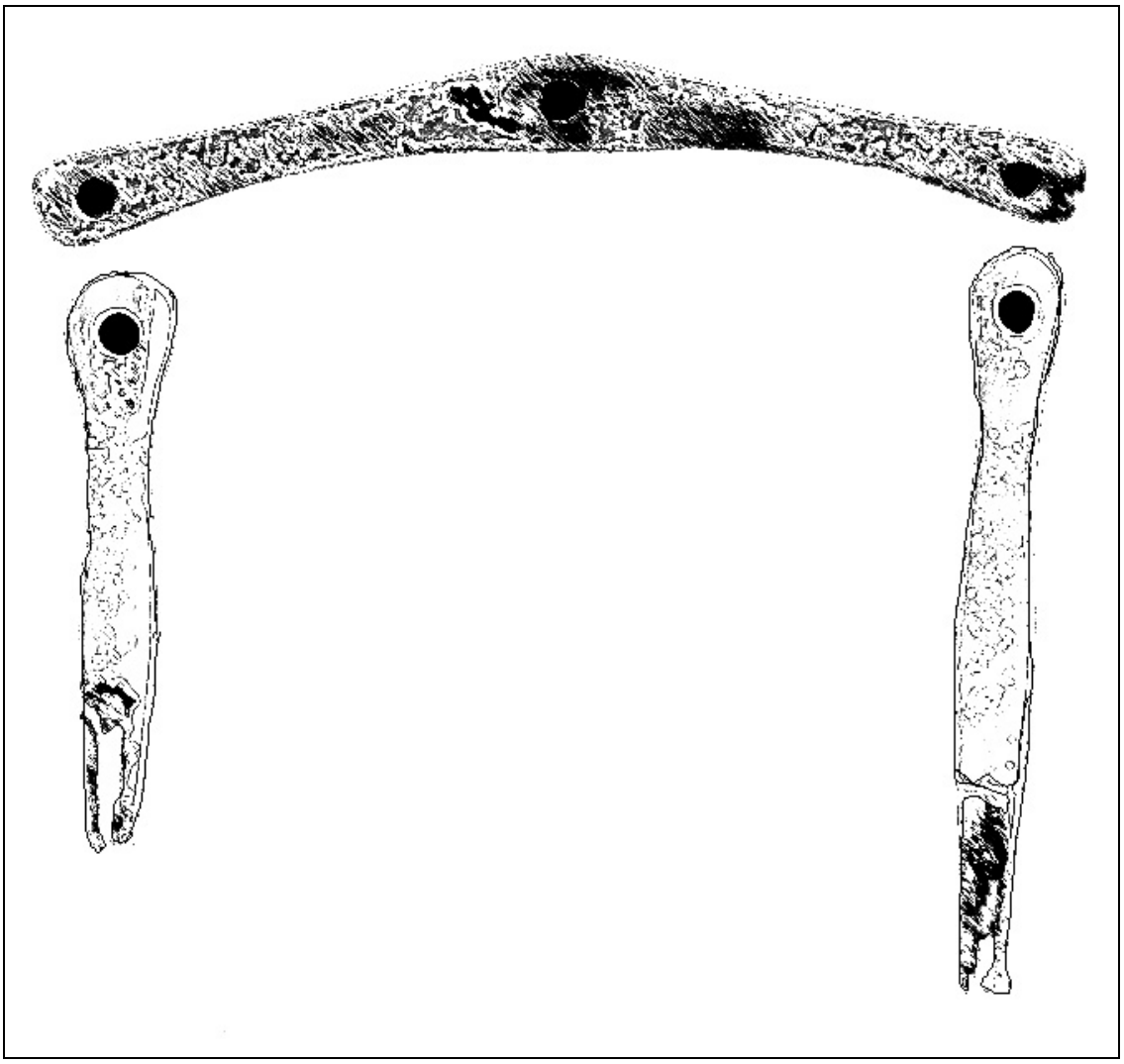

Figure 7: Components of Nunivak cod hook in collection of the Museum of Anthropology, University of Kentucky. Interviewees provided detailed descriptions of this fishing implement including its missing pieces and method of manufacture (Drawing adapted from photograph by George R. Milner in VanStone 1989:62).

Modern Period

The Bureau of Indian Affairs, ANCSA Office conducted field investigations of Nunivak historical sites in 1986 and 1991. The work resulted in a large body of data and a six volume overview report (US BIA 1995). Volumes 1 – 3 of the overview were reviewed for references to Pacific cod, grayling and red salmon. Pacific cod is not specifically mentioned in the report, however, there are general references to "cod" and these are distinguished from "tom cod" so it is safe to assume they refer to Pacific cod. In some cases Arctic cod are identified, these too probably refer to Pacific cod. The BIA report associates 11 sites on the island with cod. Eight of the sites are referred to specifically as spring camps, while all 11 were identified with summer occupations. The report identifies red salmon and grayling as present (1995[1]:7-8), however there are no references to either species in the individual site abstracts (1995[2], [3]). Places associated with Pacific cod by BIA ANCSA are noted in the place name glossary (Appendix A).

Sites identified as "spring camp" in the BIA ANCSA work were primarily associated with sealing and not necessarily with cod fishing (e.g., the site of *Cingigmiut*). On this project elders clearly speak of traveling from winter villages in spring to establish seal hunting camps, but also provided examples (e.g., *Pengurpagmiut*, *Cingigmiut*) where these same camps remained occupied after the ice cleared and sealing ceased; then cod fishing replaced seal hunting as the main activity. One can imagine too that the activities overlapped as a matter of circumstance.

One site, *Englullugmiut*, investigated by BIA ANCSA at Cape Mendenhall was documented as a current "cod-fishing camp" during 1986 survey work. It was occupied at the time by one family for a brief period when cod were available. The BIA ANCSA report concludes, "Cod have not always been a reliable resource in the Cape Mendenhall area." But the site was probably used as a cod fishing camp in the past (US BIA 1995[2]:190).

Pratt (1989) elaborated on the use of *Englullugmiut* in notes made from an interview with Richard Davis of Mekoryuk. The interview provides a perspective on the opportunistic nature of site use relating to natural variability in fish availability and timing of runs. Pratt described his first encounter with Davis, at the site, in 1986:

> Richard's family was cod-fish camping at *Englullugmiut*. They stayed at this site for about two weeks. This was the only time Richard ever used this site, and he only stayed there on that occasion because of its proximity to *Qengartaraag*/*Tacirmiut* (i.e., only a small amount of gas was required to travel there and back) and the fact that 1986 marked the return of cod to Nunivak after about a 20-year absence … so he decided to catch cod. (Richard's family was evidently waiting for the fish [presumably chum salmon] to arrive in the *Tacirmiut* area at the time he decided to move to *Englullugmiut*.)

The BIA ANCSA Nunivak overview report was published without the benefit of complete transcription of tapes. Some transcripts contain errors due to transcribers who did not fully comprehend the Nunivak dialect. For example, in accordance with the Yup'ik Eskimo Dictionary the Cup'ig term "*atgiiyar*" was often translated as "Arctic cod" rather than Pacific cod. This and other linguistic issues are presented in Part IV, above. The BIA ANCSA Nunivak oral history tapes (176 recordings) remain a large reservoir of, for the most part, under-processed data.

Dennis Griffin conducted field work on Nunivak Island and archeological excavations at Nash Harbor for the Nash Harbor Project (1994-1999). His research included extensive interviews with *Nuniwarmiut* elders and others with past affiliations to the place. Interviews resulted in a collection of approximately 60 recordings (Appendix J). Like the BIA ANCSA tape records, many of these are not fully translated.

Griffin stated, "Historic accounts of subsistence resources available in the Nash Harbor area emphasize the availability and abundance of (Pacific) cod" (1999:91). He reported Pacific cod were historically available during the spring (as early as May) and summer and were caught using hook and line from kayaks in the deeper waters around Nash Harbor (*Ellikarrmiut*). The *Ellikarrmiut* would butcher cod "by the beach" and spread them out on the rocks to the north of the village to dry (Griffin 2004:151, 153 [photo]). In this project elders described both butchering and drying at *Usragglit*, north of Nash Harbor village proper. Griffin, perhaps erroneously, ascribes the place name *Usragglit* to the method of drying the fish on the rocks that took place there. The specific etymology of the word is currently unknown.

Historical photographs hint at another traditional method for the open air drying of cod in locations lacking large flat-topped boulders. In one early photograph taken at Mekoryuk (Plate 14) fish appear to be drying on a stack of logs arranged like a raft.

Plate 14: Fish drying on driftwood logs, Mekoryuk ca. 1927. Edward S. Curtis photo (Library of Congress, Prints & Photographs Division, Edward S. Curtis Collection, also Curtis 1930:12).

Archeological Record

Griffin (1999, 2004) provides archeological evidence of an abundance of Pacific cod at Nash Harbor. He stated:

> Pacific cod make up the predominant fish species recovered from Nash Harbor excavations. Historically, they were locally available during the spring and summer and were caught using hook and line from kayaks in deeper water (2004:151).

In excavations at *Ellikarrmiut* (Nash Harbor Village) in 1996-97 Griffin recovered large quantities of Pacific cod bones. Souders (1998) who conducted separate faunal analysis on Griffin's excavation materials also reported Pacific cod "constituted the overwhelming majority of fish remains - perhaps all animal remains - recovered in Nash Harbor excavations." The oldest reliable radiocarbon dates obtained by Griffin for human occupation of Nash Harbor village date back about 2500 years. He claims, "Pacific cod…were actively sought during the proto-historic and historic

periods and appear in large numbers in *Ellikarrmiut*'s late Thule period archaeological record" (Griffin 1999:91).

Plate 15: Bone fish hook recovered from *Englullrarmiut*, 1986. Shown twice actual size (Image courtesy BIA ANCSA Office).

BIA ANCSA investigators recovered several artifacts from Nunivak sites related to fishing activities, including a bone fish hook (Plate 15), and notched cobbles (Plates 16 and 35) that may have functioned as net sinkers or weights for cod fishing rigs (Figure 7, Plate 36). While identified as net sinkers by BIA the cobbles are also consistent with descriptions obtained from interviewees of anchors for Pacific cod composite fishing apparatus.

Plate 16: Notched cobbles collected by BIA ANCSA Archeologists at *Penacuarmiut*, 1986. Items shown near actual size (image courtesy BIA ANCSA Office).

Fisheries Research

A substantial amount of technical and government sponsored "grey literature" on Bering Sea fisheries exists; this report, however, includes references to only a few studies where some indigenous knowledge was reported for Nunivak Island and Pacific cod. A U.S. Fish and Wildlife Service (USFWS) report prepared by Jerry Hout (1966) provides some baseline data for Nunivak fisheries including: species present, numbers obtained for subsistence purposes, locations of camps and specific stream characteristics.

The USFWS project presented data from 18 streams surveyed July 16-30, 1965. The 48 page report should not be overlooked when conducting future studies of Nunivak fisheries. The document was digitally scanned and is available in PDF format on the NPT website (http://www.nunivakisland.org/Cod%20project/hout1966.pdf).

The USFWS crews collected or recorded at least 21 species of fish in their Nunivak survey. No Pacific cod or grayling were captured or observed either dead or alive. The report contains one brief but significant statement regarding Pacific cod:

> Cod (Gadus sp.): This fish was reported to have disappeared in the mid 1940s, but was formally [sic] abundant and utilized by the people of Nunivak (Hout 1966:14).

According to Hout (1966:13, iv) red salmon were either observed or reported in several streams and at stream mouths. An estimated 200 reds were observed in late August 1964 at "the mouth of the stream emptying into the head of Dooksook Lagoon." None were seen during the July 1965 walking survey, but a University of Alaska researcher (Bos, a biologist studying musk oxen) "reported reds at the head of this lagoon on August 11, 1965." This is the river *Tuqsum Kuiga*, discussed further in this report in the Results - Traditional Knowledge section.

Hout also stated residents of Nunivak reported small numbers of red salmon were obtained in Mekoryuk River (*Mikuryarmiut Kuigat*), Jayalik River (*Cayaleg*), Paimiut (*Paamiut Kuigat* and *Cayalegar*), Ahlik (*Al'er/Alrem Kuiga*) and Kikmiktaliksamiut River (*Qikmirtalegmiut Kuigat*). The Jayalik and Paimiut populations were reportedly available in mid-May; for the others dates were not specified (see also *A Stream Named Cayaleg*, in the Results – Traditional Knowledge section of this report).

Arctic grayling were not observed or collected by Hout's team. However, they were reported, apparently by a Nunivak source, as present in one stream only, Kiyakliksamiut River (*Qayigyalegmiut Kuigat*), where they were observed in August and described as abundant (Hout 1966:15).

In addition to the results of stream surveys and fish inventories some general statements are made in the USFWS report on the importance of fishing in the traditional (and transitional) culture of the *Nuniwarmiut*:

> The abundance of primitive fishing equipment such as fish spear points, fish hooks, net gauges and shuttles, and bone sinkers at the old village sites suggests that fish were an important source of food of the early residents. The numbers of fish occurring historically has not been recorded, but stories told by the people indicate that there were times of starvation. One story describes the starving of the entire population of villages in the area from Cape Mendenhall to Cape Manning (Hout 1966:5).

Hout (1966:8) observed in the past net sinkers were made from bone or rock and that bone sinkers were also seen on several nets during the 1965 survey. He further stated that "traditional barbed, ivory or bone points used on fishing spears had been replaced by nails, flattened and filed to form barbs."

Some statements such as those concerning the fishing habits of the *Nuniwarmiut* in the 1960s may be extrapolated to relate to Pacific cod in earlier decades. For instance,

> The size of the salmon catch is regulated by the fishing effort. On Nunivak the people fish only a few hours a day to stay within the limits of the number of fish the women can dress, split and hang on the drying racks. Usually there is little or no fishing during bad weather, which on Nunivak can last for several days, and there is no fishing on Sundays (Hout 1966:8).

Plate 17: The late Kay Hendrickson (*Qiawigar*) served as guide to Hout and crew during their 1965 field surveys (photo courtesy USFWS, Yukon Delta National Wildlife Refuge).

Hout (1966:11) also described (for salmon) the method (applied to both salmon and cod) referred to later in this report by contemporary *Nuniwarmiut* as *inglukeggluk'i* (pairing):

> When the fish are nearly dry two fish are tied together by making a split in the caudal peduncle of one fish and sticking the tail of the other through the split.

An earlier USFWS report (Ellson et al.1950:14), based on fieldwork conducted in 1949, cited "local residents" as providing information about the presence of "cod" in the vicinity of St. Lawrence Island, King Island and Nome. However, the St. Lawrence and King Island references may refer to Arctic cod rather than Pacific cod. The report further states:

At Nunivak, steamer passengers have been reported catching cod while the ship is anchored […] while the natives of Nunivak Island spear [halibut] in shoal water in June (Ellson et al.1950:14).

Plate 18: "FWS staff, Joe Ellson, E. Dietrich, H. Hildebrandt, and Don Powell, Bering Sea off Nunivak." Photo and caption from USFWS, image FWS-6850. Ca.1949 (USFWS 2005).

Later (and more accessible) references indicating abundant Pacific cod north of St. Lawrence Island appear to exaggerate their occurrence. The *Alaskool.org* website (2004) repeats an error contained in the sourcebook, *Alaska Regional Profiles* (Selkregg 1976[3]:160). In the latter work Ellson's report is misinterpreted by stating Pacific cod were "frequently encountered" near St. Lawrence Island. Ellson's survey data along with the vague anecdotal references presented in the report would indicate Arctic cod (*Boreogadus saida*) rather than Pacific cod. Selkregg (1976[3]:165) also does not include Pacific cod in a list of "Important Animals of the Marine Neritic Environment" of the north Bering Sea, while Arctic and saffron cods are both listed.

In seven hours of test fishing by net troll in as many locations in the proximity of St. Lawrence Island (north, west and south), Ellson's crew caught no Pacific cod or halibut between the dates of June 25 and June 27, 1949; however, 32 Arctic cod were taken, as well as small quantities of capelin and sole (Ellson et al. 1950:52). East of St. Lawrence, about midway between the island and Norton Sound, Pacific cod were taken in test trolls (July 2 – 3) at and south of 63°05' N (1 fish), and generally increasing toward the south to a maximum of 37 fish at 61°46'N 168°42'W (193 km., 120 mi., northwest of Nunivak Island; Figure 8).

The record of Pacific cod in the vicinity of Nunivak in 1949 is relevant; however, no testing was done in near-shore waters. The closest test occurred at 59 km off the southwest coast. The 1949 test trawl data (Ellson et al. 1950:37) indicate Pacific cod occurring north of Nunivak were non-breeding fish that probably followed prey species (e.g., capelin and sand lances). In 23 separate drags north of 63º N. latitude only one Pacific cod was netted by the survey crew (Ellson et al. 1950:49). The waters to the west and south of Nunivak Island produced the best cod and flatfish catches (Ellson et al. 1950:4, 25), with the largest cod (16 lbs./7.25 kg.) taken west of Nunivak Island (Ellson et al. 1950:39).

Figure 8: Bering Sea test fish locations, June 24 – July 4, 1949. Numbers indicate USFWS trawl drag number with cod/halibut ratio in parenthesis (adapted rom Ellson et al. 1950).

During the 1949 study, stomach contents of cod taken west of Nunivak were examined and the principal food items found were tanner crab and capelin, but also shrimp, clams, worms, snails, euphasids, yellowfin sole and sculpins. Some had fed exclusively on capelin, indicating feeding above the bottom (Ellson et al. 1950:40, 45).

The only references found to Pacific cod fishing among the *Nuniwarmiut* in the period from 1950 – 1985 occur in Alaska Department of Fish and Game reports (Pete 1984, 1991a, 1991b). Pete contends that after some families had moved away from the island in the 1950s, some returned to

Mekoryuk in the 1970s to "fish for salmon, halibut, Pacific cod and herring" (Pete 1991a:15; 1991b:7). The evidence presented in this report suggests Pete's inclusion of Pacific cod in the statement may be based on assumption and reverse projection.

The ADFG reports include several other references to Pacific cod that are not placed in a historical context. For instance, the 1984 report states, "Herring harvesting off the east and south sides of the island sometimes occur in conjunction with spring sea mammal hunting and cod and halibut jigging trips" (Pete 1984:12, citing Stickney 1982: field notes).

Pete reported that beginning in the mid-1980s Nunivak and Nelson Islanders saw decreasing numbers and less reliable runs of herring than in the past, such that some families that typically fished for herring for food concentrated on halibut and Pacific cod instead (Pete 1991a). Herring was identified as choice bait for subsistence halibut and Pacific cod fishing (Pete 1991a:17; 1991b:17). At Nunivak it was reported that halibut, Pacific cod, and salmon were dried at fish camps without smoking (Pete 1991a:16; 1991b:18).

In her discussion of the Nelson Island seasonal round, Fienup-Riordan (1983:35-36) makes no reference to Pacific cod. She does state however, "In late June...Mekoryuk families cross the strait from their spring camps on the southern part of Nunivak Island. Camping outside the village down by the fish racks, they sell dried codfish, and come into town to check the stores and visit with old friends (1983:114)."

Finally, research conducted by the National Oceanic and Atmospheric Administration (NOAA) shows that seasonal migrations of Pacific cod in the Bering Sea occur between the continental slope and shelf. Cod spawn and overwinter in deep waters, 100 to 400 meters. Following spawning, the bulk of which occurs in February and March, cod move to more shallow, near-shore feeding waters (30 to 75 meters) in the summer. NOAA reported "the location and concentration of spawning aggregations are poorly known, the magnitude of any migration between spawning and feeding grounds is also unknown." However, their report concludes "the biomass of Pacific cod increased significantly in the mid-to-late 80s….[1991] stocks are characterized as high in abundance, but appear to be declining from the relatively high levels of the 1980s" (U.S. Dept. of Commerce 1992:2-11). These scientific data conform very well with statements obtained from Nunivak Island fishers and elders.

VI. RESULTS – TRADITIONAL KNOWLEDGE

> Our ancestors were not similar to us. Their agility was superior. Although we don't know all their traits, their oral history is passed on down to us. They did not use tape recorders for their oral history. But their oral traditions were taught inside men's community houses. That is how we did it.
>
> I believe when we initially went out reindeer herding we carried out our routines just as our ancestors did. When it rained, we strip our pants and walked all day like that. When night dawned, we put our pants on and went to sleep in the open tundra although it heavily rained, as we didn't possess tents. Or we didn't pack any coffee. But we did possess dried fish, dried cod and seal oil. – George Williams, Sr. (1991, translated from Cup'ig)

The primary sources for this study were the transcribed and translated oral narratives of Nunivak elders. The narratives derive from two sets: those resulting from interviews conducted specifically for this project and, secondarily, earlier tape transcripts from the BIA ANCSA collection. The use of secondary resources was limited to those which had previously seen some level of processing and were accessible in electronically searchable formats.

Plate 19: *Nuniwarmiut* girls, Nan Kiokun (*Car'er*), left, a primary contributor to this report, with Caroline Ivanoff (*Miya'ar*) and Bernice Hendrickson (*Caq'ar*) seated near the edge of the bluff above Nash Harbor, ca. 1936-37. Hans Himmelheber photo.

Interviewee responses were typically detailed and specific. Among them there is consensus that Pacific cod were a viable, predictable and heavily exploited resource in the first half of the 20th century. The resource abruptly disappeared from the subsistence regime at Nunivak Island around the year 1950. Collectively interviewees' statements provide a balance of perspectives covering a period of time from about 1920 to the present. For example, the youngest (born ca.1930-1950) recalled few or no details of the earlier cod fishery and its crash, while the eldest interviewees (born prior to 1930) spoke little or not at all about the mid-1980s return of cod.

The narratives stand apart from yet complement one another in their depth and scope as well. Some interviewees focused on geography while others emphasized method or technology. For instance, Nan Kiokun provided a lengthy travel narrative highlighting places associated with cod harvests and availability while Ida Wesley offered a detailed description of a cod fish hook apparatus, and Nancy Edwards described cache construction and caching methods in depth.

Presentation and Organization of Traditional Knowledge

Interview transcripts were edited, reorganized and grouped according to topics in order to facilitate access and analysis. The section begins with brief biographical sketches of project interviewees, including a summary of the interview context, geographic scope, and in some cases earliest memories. The sketches are not inclusive and some provide more depth than others; the personal information presented in them comes primarily from the interviews and were selected and edited as they relate to Pacific cod, fishing in general or information pertaining to relative dating and authenticity.

Following the biographies, selected narratives emphasize particular places. Each of these geographically based narratives were chosen and edited for their association to various aspects of the Pacific cod fishery. These narratives tend to be general in content and are meant also to illustrate the geographic scope of Pacific cod fishing at Nunivak. After presentation of the geographically based narratives, core topics relating to Pacific cod are presented - availability, seasonality, habitat, harvests, preparations, methods, gear, processing, storage, culinary and non-food uses, and finally the disappearance and reestablishment of the fishery. The last part of the traditional knowledge component is devoted to species other than Pacific cod.

Naturally, some of the information provided by the interviewees crosses categories; this presentation attempts to limit duplication of narratives. Other information contained in narratives that did not specifically relate to Pacific cod or other fish and fishing activities has for the most part been omitted from the report narratives. The narratives contain over 90 Cup'ig language toponyms as presented by Nunivak elders. Readers are directed to Appendix A: *Glossary of Cup'ig Place Names Mentioned in the Report*, Appendix B: *Project Maps*, and the introductory subsection, above, *Place Names and Cup'ig Orthography*.

Lastly, interviewees' specific statements cannot and should not necessarily be interpreted as representative of all *Nuniwarmiut* at all places and over all time periods. Personal choice, family group associations, and geography all affect fishing, hunting and gathering behavior, including methods and equipment.

Interviewees

Nan Kiokun (*Car'er*, ca. 1913 - 2009)

Plate 20: Nan Kiokun (right) reviewing historical photographs with Howard Amos and Prudy Olrun, Mekoryuk, June 13, 2005.

Nan was the eldest person interviewed on this project. Her interview was the most difficult and time consuming to process – in part because her age, speech patterns and use of some archaic terms made translation to English challenging. The core of Nan's narrative consists of her earliest memories of Pacific cod fishing. She presents these memories in the form of a travel narrative, recalling a kayak trip made with her family from *Miqsarmiut* on the northwest coast to *Ciguralegmiut* at Cape Mendenhall on southern Nunivak. Her first person narrative was converted to a passive third person re-telling. This was necessitated by the awkwardness of the Cup'ig to English translation (a smoother or more refined translation is certainly possible given more time).

One segment of the interview dealing specifically with cod harvest activities directly participated in by her (probably as a teen) is presented in the first person voice. This provides some indication of her narrative style, but this narrative too was reorganized and edited for clarity in the English presentation.

Nan became aware (*ellangua*) of herself in her environment while living at *Miqsarmiut*. Her earliest memory concerning Pacific cod occurred in the early spring when her father departed and returned with Pacific cod, halibut, pollock, sculpin, and perhaps herring. Her mother cut the cod and placed them on boulders to dry at *Miqsarmiut* and also at the point of land across from the mouth of its river (*Miqsarmiut Kuigat*).

George Williams, Sr. (*Can'irral^{z}ria*, born ca. 1922); Helen Williams (*Ukayir*, ca. 1929 - 2009)

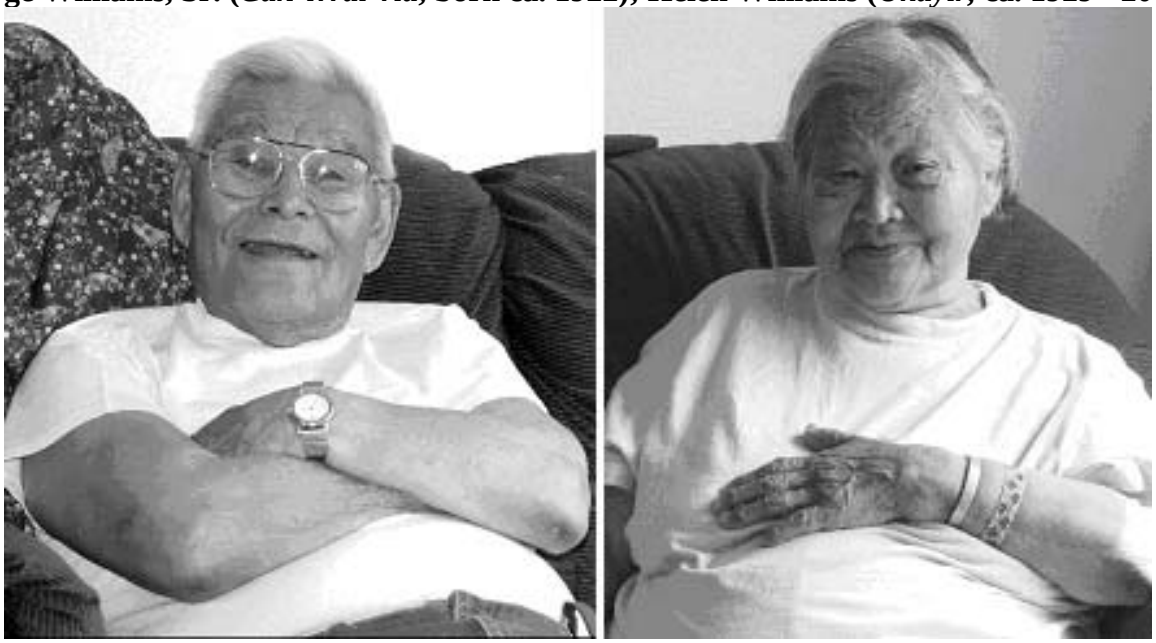

Plate 21: George Williams, Sr., and Helen Williams, June 18, 2005.

George is the younger brother of Nan Kiokun (above). At the time of the project he and his wife Helen were living in Bethel, where they were interviewed. Helen participated primarily by supporting or affirming George's statements, but also by occasionally contributing information of her own.

George is one of the most learned and articulate of the Nunivak elders; unfortunately, a Cup'ig speaker could not be secured in Bethel to act as interpreter for the interview. An experienced Yup'ik interpreter reluctantly agreed to assist, and did her best, but the interview did not flow well and the language barrier added to the difficulties in understanding and interpretation. The interpreter's lack of knowledge of the primary topic and of Nunivak geography added to the lessened quality.

Out of deference to the younger Yup'ik interpreter, both George and Helen interspersed their narrative with Yup'ik terms, but sometimes Cup'ig words were misunderstood by the interpreter. For example the Nunivak term for chum salmon, *mac'utar*, was misinterpreted as "trout." The interviewer did not speak Cup'ig or Yup'ik, which compounded the problem. Despite these shortcomings there is useful and unique information on the tape, but it lacks the depth of most of the other recordings.

George was born on the northwest coast of Nunivak at *Miqsarmiut*. He also lived at Nash Harbor as a youth, but did not attend the school (built 1923) there. He began hunting and fishing in earnest later, after moving to southern Nunivak. On the south side he resided at *Qengartaaremiut* and was raised by his adoptive father, Abraham *Lurtussikar*, who George described as an older, rich man. As soon as George was capable of using a kayak (he estimated his age at between 10 and 15 years) he began fishing for cod and hunting for land and sea mammals, "I was beginning to get them," he said.

Plate 22: George with his older brother Jack U. Williams, Sr. at Nash Harbor. Titled: Duck-skin parkas, Nunivak, ca. 1927. Edward S. Curtis photo. Library of Congress, Prints and Photographs Division, Edward S. Curtis Collection, also Curtis 1930:32.

George's narrative focused mainly on his early years, those prior to his eventual move to Mekoryuk. He and Helen also discussed the presence of Pacific cod in the Mekoryuk River. According to the 1940 U.S. Census (taken in 1939) Abraham Luktusegok (*Lurtussikar,* born ca. 1869) and George (about 17 years old) made up a single household in Mekoryuk. They shared a 12 x 12 ft. sod hut, owned one boat valued at $900, two nets valued at $450, 10 traps valued at $10, one dog valued at $5 and one engine (presumably an outboard motor) valued at $50.

Susie Shavings (*Apurin*, ca. 1922 - 2009)

Plate 23: Susie Shavings, December 7, 2005.

As a child Susie became aware of herself in her environment at the village of Mekoryuk. She moved with her family every spring to *Pengurpagmiut* (Cape Etolin area) for seal hunting, followed immediately by Pacific cod fishing. While she knew Pacific cod were harvested in other areas of the island, *Pengurpagmiut* was the only place where she personally experienced the activity as a youth. She stated that she was too young to fully participate in these activities,

> That is how they worked very hard as I saw them. I only observed, as I was too young and not ready. I watched them; they were always busy, never stayed idle. That is how it was when I was a child; the occurrences that happened on that beach.

Susie married Harry Shavings, *Umyan* (born ca. 1909), about 1939. They continued to live in Mekoryuk, where they occupied a sod house and practiced a subsistence way of life as young adults and into their later years. In her narrative concerning Pacific cod, Susie chose to highlight childhood memories, although presumably she and her husband continued the spring sealing and cod fishing traditions at *Pengurpagmiut* after their marriage. She stated that cod was reliable and consistent from year to year, and she and her husband continued to acquire and process cod in a similar manner as described from her childhood when she reached adulthood and after their marriage.

After the cod crash in the late 1940s their subsistence regimen changed, most notably they traveled further, to southern Nunivak, to procure chum salmon. Susie stated that their first fish camp on the southside was at *Tacirmiut* (Duchikmiut) at the mouth of *Tacirmiut Kuigat* (Duchikmiut River) on the large estuary known as *Tacirrlag* (Duchikthluk Bay). Later they camped at *Iqangmiut* and

Mecagmiut at the next large bay, *Tacirvag*, to the west of *Tacirrlag*. In time they moved their summer fishing base to the large camp at *Nunarrlugarmiut* east of *Tacirrlag*. Eventually Susie and Harry moved to Anchorage, following his death in 1989 she moved back to Mekoryuk and apparently stopped going to fish camp in 2003.

Plate 24: Susie Shavings (*Apurin*), left, and Annie Davis (*Umgar'er*), probably at Mekoryuk, Photograph by Amos Burg, Spring 1941 (Oregon Historical Society, #OrHi 95187).

Ida Wesley (*Icaran'in*, born ca. 1929)

Plate 25: Ida Wesley, December 8, 2005.

This project marked the first time Ida had been recorded. Portions of this interview, specifically those dealing with time periods, were difficult to interpret. Some time estimates appear erroneous and translations of her statements do not always make temporal sense. Deeper analysis, follow-up questions and perhaps a more careful translation might help clarify some of the apparent discrepancies.

The difficulties of understanding or interpreting the transcript do not lessen the value of the recording and transcription. Ida clearly possesses detailed knowledge of many aspects of Pacific cod harvesting (as well as other topics). Due, in part, to the circumstances of her upbringing Ida's narrative was one of the most valuable gathered for this project.

Ida was born at south Nunivak at *Englullugmiut* on the east side of Cape Mendenhall (*Cingigglag*). Her mother died when she was very young and she and her younger siblings were raised by her father *Kinguiral*^{z}*ria* (Luke King, born ca.1901). During the 1930s the area from *Paamiut* to Cape Mendenhall contained several winter villages. Her family also resided at the large village of *Ciguralegmiut*.

Ida described their way of life as difficult and her family as "poor"; lacking western material items and simple foods, such as flour. She spoke of seeing open boats (*angyapig*) with sealskin-covered hulls used by some *Nuniwarmiut* who traveled to Nome and Norton Sound (*Tacir*) for trade. She expressed astonishment at seeing boat owners returning with food items like flour and sugar and material goods that she had not seen before.

Her family also stayed at *Kuigglugarmiut* in the area of *Nunarrlugarmiut* and its extensive, sheltered estuary (*Nunarrlugarmiut Taciat*). There they also fished at *Iqangmiut* and its river for *mac'utar* – chum salmon, by clubbing them in the summer time. As the oldest child Ida often accompanied her father and he taught her many life skills (including those normally reserved for young boys). From him she learned to fish.

> I accompanied and helped him, when I see fish (*iqalluyagar* - Dolly Varden and *ciayuryar* - silver salmon), he asked me to herd them towards him as he was teaching me how to fish. … My father taught me a lot so that if I were to live I would follow his methods.

Later she moved to Mekoryuk and eventually stayed there with her husband (Harry Wesley). She said:

> I don't know the year because I used the ancestors' tradition. I was truly an Eskimo, I don't know exactly when.

Plate 26: Ida Wesley with Howard and Muriel Amos. Mekoryuk, December 9, 2005.

According to the 1940 census Ida lived in Mekoryuk with her extended family in 1939; she would have been about ten years old. Ida (with help from translators) estimated the year of her marriage as 1945. The relative date is important to this study because Ida used the date of her first born child, several years later, as a marker for the disappearance of Pacific cod from the waters around Nunivak Island.

Nancy Edwards (*Laakautarkar*, born ca. 1931)

Plate 27: Nancy Edwards, December 8, 2005.

Nancy's narrative focused on her earliest memories of Pacific cod at the village of *Ellikarrmiut* (Nash Harbor). She was born in the spring of 1931 to the west at *Qikumiut.* She said:

> During that time, I had two mothers. The one who gave birth to me [Pansy Jones, *Macian*], walked to go breast feed me, to ensure that I don't starve. She went from Nash Harbor to *Qikumiut*, she went to go breast feed me. That's why I'm healthy [said with a laugh].

She was adopted and raised by Fred (*Cikulqaar*) and Bess Weston.

> Bess was also my mother. Because they traveled a lot I didn't learn much in school. He [*Cikulqaar*] took me when he traveled, by a kayak. They also walked to *Talungmiut* from Nash Harbor to acquire birds for parkas. I walked and participated. I became aware when we reached the other side. When I arrived to the grasses and compared them to my height they were as tall as I was.

Plate 28: Nash Harbor village ca. 1936-37. View toward north from *Ellikarrmiut* (photo: Hans Himmelheber, in NPT collection).

Joe David (*Tanqeral^{z}ria*, born ca. 1934)
The interview with Joe was conducted in English. He was born and raised in Mekoryuk. His father, *Arnarayar* (David Ongnakayok), died before Joe finished the 7th grade. Joe left school to help his mother (Beatrice, *Pantungan*) by contributing with necessary daily chores. His oldest brother Alvin (*Tanriag*) was already married and away; the next oldest, Jerry (*Massualug*/*Kakianer*) did most of the hunting and wood gathering, which left Joe to attend to household chores like chopping wood and hauling ice or water.

About five years after his father's death Joe's mother was remarried to Evan Harrison (*Qiuran*). The family moved to Nash Harbor (ca. 1951) and in Joe's words he "lived there like an Eskimo." Harrison had a boat, so they traveled to the south coast of Nunivak in summer for subsistence fishing. Joe and his brother also shared a dog team which they needed to feed. Joe worked for wages as a reindeer herder at about 15 years of age, often staying out away from villages for five or six days at a time, sometimes longer.

The interview began with Joe providing a detailed history of his wage employment years. Employment eventually led him to live off the island for most of his adult life. While he stated he did not know much about cod fishing, since he was not very old when they disappeared, he was able to provide substantive information about the resource at various locations.

Joe lost his first wife to cancer and eventually married Margie (King), also of Mekoryuk. They resided primarily in Bethel and Anchorage until retirement in 2006 when they returned to full-time residence in Mekoryuk. These days they are very active in the community and in subsistence fishing

and gathering. They fish in the Mekoryuk area and travel south to *Taciqvag* in the summer time where Joe's sister's family has their fish camp.

Joe was the only interviewee to directly ask the Principal Investigator the purpose of the study, and he offered the following advice:

> Let me tell you, if you happen to go around and talk to one of the fish camps - eat what they eat, that's the best thing that you can do, eat with them. That's how the people really love it.

Hilma Shavings (*Apurin*, born ca. 1935) and Henry Shavings (*Qiuran*, born ca. 1924)

The interview with Hilma was conducted in English. Hilma is the daughter of Nan Kiokun and lives in Anchorage with her husband Henry. She stated that Henry is "eleven years my senior." The birth years provided by Hilma (above) differ from the dates recorded in the 1940 census. This type of discrepancy is not uncommon among the *Nuniwarmiut* elders. Hilma explained it like this:

> *Taprarmiut*, that's where he was born, sometime in 1924. In those days, when he was little, he's very hyper. He wanted to hunt at really young age. In those days there were never birth certificates, a guy named Paul Ivanoff had to, I guess, add more years so he could be older to hunt. So he got stuck with that. In those days when they were getting birth certificates, they go by what years (major events) happened. They asked the parents about what year, they were using that big epidemic or something to determine when a person was born, about between what year and what month. So the parents usually guesstimate.

Hilma spent the first years of her life at the village of *Paamiut* (also called *Cuqucuryarmiut*) on the south coast of Nunivak. When she was old enough to attend school her family relocated to Mekoryuk (ca. 1940). This was a time of profound change for the *Nuniwarmiut*.

Henry and Hilma moved from the island in 1976 but return to Mekoryuk regularly to visit and for subsistence gathering. Typically they return in August to harvest ripe berries and Hilma also harvests fall grasses for weaving. Apparently they maintain a cabin at *Qavlumiut*, a base camp for their fall gathering located about five miles southeast of Mekoryuk.

Henry was born at either *Qavlumiut* or *Taprarmiut*. As a youth he traveled with his family back and forth from Mekoryuk to *Taprarmiut* until his maternal grandfather passed away; afterwards they moved permanently to Mekoryuk. The 1940 Census indicates Henry was living in Mekoryuk in 1939 and had at that time attended school for one year; he would have been about 15 years old. Hilma said, "[In] them days we don't have hardly any tents, we used to live in sod houses, some use sod houses [at *Taprarmiut*] for their camping too."

Henry's family also moved each spring to Cape Etolin, for seal hunting and cod fishing. Hilma said, "That's where they get their codfish by hooking." They would move their belongings across the frozen bay, and after they had secured codfish they returned to Mekoryuk by kayak. Today, she said:

> They don't do that anymore either too much, those younger people doesn't, not netting, they don't hunt. They're into their grocery stores and quick processed food.

Prudy Olrun (*Panigarkar*, born ca. 1940)

Plate 29: Prudy Olrun, June 14, 2005.

Prudy was the youngest person formally interviewed for this project. She is fully bilingual in English and Cup'ig, but spoke primarily in English during the interview. Prudy was born in Mekoryuk. Her earliest memory associated with Pacific cod was of a piece of the dried fish. This must have been around the time when the cod vanished, when she was a young girl, perhaps six or seven years old (1946-47) according to her own estimate. She said, "That's all I remember (about cod), when I was that small, that's all. My mind went blank after that."

She didn't remember where her first memory occurred. When asked (by the interpreter) if it might have been at Cape Etolin (the spring and summer camp of *Pengurpagmiut* near Mekoryuk) she thought not and speculated that it could have been at the area of *Qengartaarag* area (east side of Cape Mendenhall on south Nunivak), where her parents camped when she and her siblings were young.

Following her earliest memory, Prudy did not witness Pacific cod again until well after her marriage to Dan Olrun and the birth of their children. Prudy and Dan maintain their fish camp at *Mecagmiut* and have fished in the *Taciqvag* area for many years. Most of her narrative concentrated on the resurgence of Pacific cod in the 1980s, the effect it had on food gathering, and relearning methods of processing and preserving the fish.

Geographically Based Narratives

While cod fishing and processing was similar at all procurement locations on the island, methods varied depending on local geographic conditions. Most elders presented at least part of their narrative within the context of specific places.

Seasonal Movements and Changes in Fish Resources (narrative fragments recorded between 1986 – 1990 with Edna Kolerok, Robert Kolerok, Daisy Olrun and Olie Olrun).

Edna Kolerok (*Panigacungar*, born ca. 1907) was interviewed in 1989 by Ken Pratt as part of a series of interviews for his research on *Nuniwarmiut* residence history (Pratt 2009). Edna stated, "I was born at *Englullugmiut* down there at *Cingigglag* (Cape Mendenhall), at that place where they dried cod fish" (Kolerok and Kolerok 1989). Edna's husband Robert Kolerok (Qungutur, born ca. 1901) also claimed *Englullugmiut* as his birthplace and referred to it in a similar manner, "That place where they used to fish for Pacific cod" (Kolerok and Kolerok 1986). These statements are noteworthy or conspicuous; of the many ways they may have characterized the place, each chose quite independently to make reference (in past tense) to its significance in association with Pacific cod.

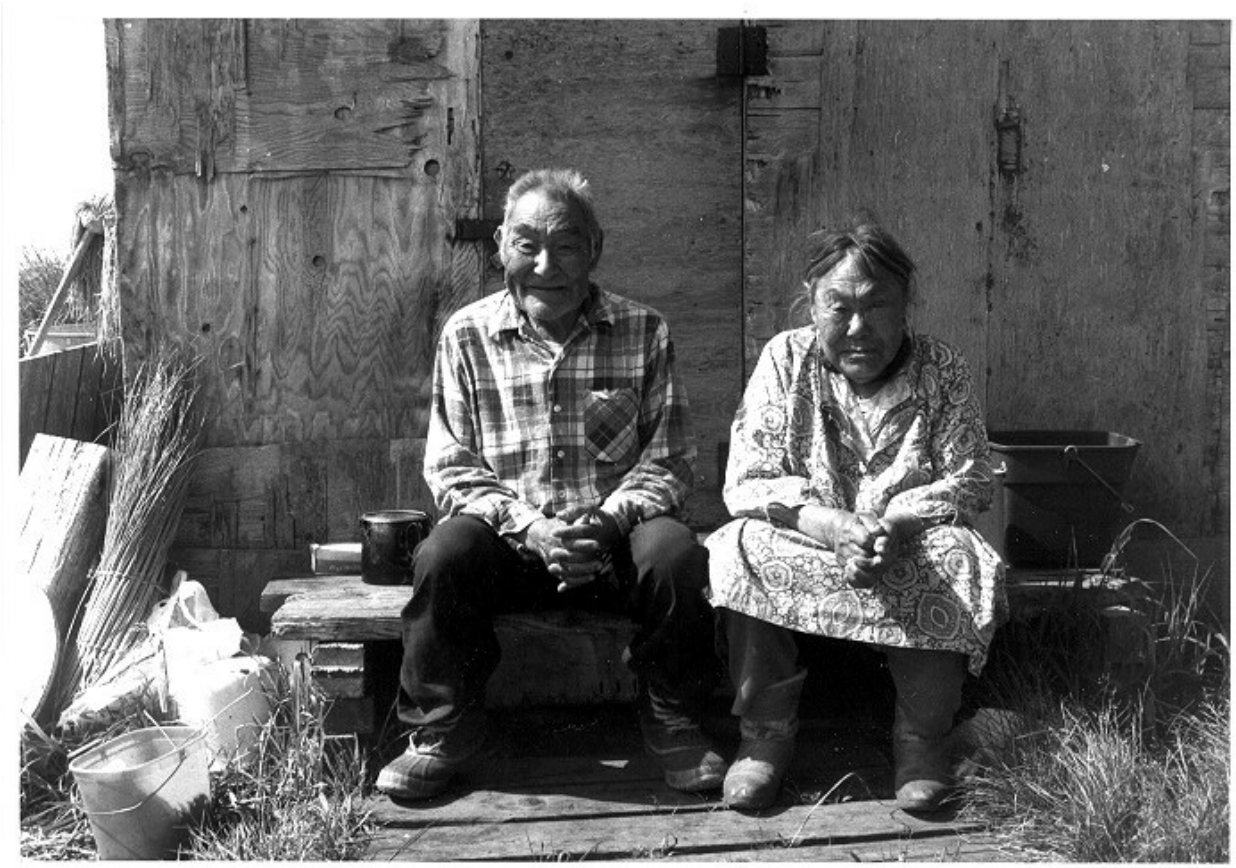

Plate 30: Robert and Edna Kolerok, Mekoryuk, August 1991.

In the 1940s Edna and her second husband, Leonard Mathlaw (*Mellaar*), moved from southern Nunivak and resided at both Mekoryuk and Nash Harbor. Edna stated that at the time of their move the people of Nash Harbor did not take many dog (chum) salmon and relied heavily on dried cod fish. She continued, "When the cod fish were gone and while I was still living with him [*Mellaar*], we moved to *Ciguralegmiut*, *Tacirrlag*."

Based on the 1940 U.S. Census and Mekoryuk Covenant Church records their move occurred after 1940 but before 1948, within the time frame most identified with the disappearance of Pacific cod. It is possible their return to southern Nunivak was necessitated by the disappearance of cod and general lack of salmon in the stream at Nash Harbor (cf. Griffin 2004:150-151).

Edna also mentioned fish availability and its influence on settlement patterns (here most likely referring to chum salmon):

> Later we went over on the other side [eastern Nunivak] to *Taprarmiut* to our first fish camp. When we went the second time, we went to *Am'igtulirmiut*, then we liked that place and kept returning there. Then one time we went there too early and there was hardly any fish, those Harrisons went from our village over there and tried fishing in that area. The fish were scarce there, so they went around to *Iqangmiut* at the south side alone. They went there alone at first, because that was Harrison's village (Kolerok and Kolerok 1989).

Olie Olrun (*Ul^{z}ran*, born ca. 1913) and Daisy Olrun (*Kisngal^{z}ria*, born ca. 1919) were interviewed by Pratt in 1990. The interview tape has only recently been translated (December 2008). The following summary is derived from Howard Amos's direct interpretation only.

Olie stated that he and Daisy resided at Nash Harbor and spring camped at *Cingigarmiut* (on the east side of the bay at Nash Harbor) where they fished for cod. No date was given but he said it was before they acquired motors for their boats. They traveled by kayak, cod was plentiful and it was their primary subsistence fish. He believed that cod were readily available until the end of June, but were not harvested later; it was considered a spring fish. Following spring and early summer cod fishing they moved further east to *Negermiut* and *Atengmiut* to gather chum salmon to supplement their cod harvests.

In later years, after the cod disappeared, chum salmon became their primary fish resource and their harvest patterns changed. They began to travel from Nash Harbor to southern Nunivak with Daisy's father, Leonard Mathlaw (*Mellaar*), to *Tacirrlag* for summer camp. They camped at *Tacirmiut*, where they focused on chum salmon which were more plentiful than on the north side of the island. Following the chum fishery they returned to *Ellikarrmiut* (Nash Harbor) and during the fall netted for seal in Nash Harbor (Olrun and Olrun 1990).

Pacific Cod in vicinity of Talungmiut, Southwest Nunivak (fragments from Andrew Noatak *Nuratar*, recorded in 1986 and 1989).

Andrew Noatak (born ca. 1900) was interviewed by BIA ANCSA personnel at his former residence, *Talungmiut*, in the summer of 1986. His statements are unique in providing information regarding Pacific cod harvests and processing at the southwest part of the island. Andrew recalled the residents prepared and dried cod at the site during the summer. In addition to gathering and processing cod they also prepared fermented fish (presumably salmon, possibly sockeye) in the fall after they moved to the other side of the river.

Andrew said they jigged for cod below the place named *Tunram Qanra* when capelin (candlefish) became numerous. The cod increased during the season of the capelin and followed them because it was their main diet (Noatak 1986). In a later interview Andrew stated:

> People that lived at *Talungmiut* didn't move in the spring time. They'd dry Pacific cod fish and dog salmon [or possibly humpies?]. Then when the Dolly Varden start to come, they'd move over to *Qayigyalegmiut* (Noatak 1989).

Plate 31: Andrew Noatak and Robert Kolerok, Mekoryuk, Fall 1987.

***Miqsarmiut to Cape Mendenhall – Travel Narrative by Nan Kiokun* (summarized)**

While Nan was still quite young (ca. 1920), and by her own account entering in and out of awareness, she went on a long kayak trip with her family. They departed *Miqsarmiut* in the spring, probably as soon as conditions allowed, and traveled to the east; it was the time of year, she said, when cod were being caught. Along the way they passed or stopped at several places where *Nuniwarmiut* were engaged in fishing activities. Their trip culminated at the southeast village of *Nunarrlugarmiut*; however, her narrative includes details of several places west of there and incorporates an additional trip they made to the large village of *Ciguralegmiut* at Cape Mendenhall.

Upon leaving *Miqsarmiut* the first inhabited place they encountered was *Ellikarrmiut* (Nash Harbor village) where Nan witnessed the residents hooking for Pacific cod, sculpin and other fish. Further on at *Cingigarmiut* (a spring camp east of *Ellikarrmiut*) she did not see fish drying, but heard that cod was caught there as well. Eventually they arrived at *Pengurpagmiut* (Cape Etolin, the northernmost point of Nunivak) where Nan recalled disembarking from a kayak and seeing many Pacific cod spread upon the boulders (Plate 33).

Continuing their travels, eventually the family arrived at the spring camp of *Cingigmiut* (*Cing'ig*, Cape Corwin). The residents of *Cingigmiut* gathered many cod, as well as pollock and halibut. With respect to cod Nan indicated there was something special or particularly excellent about the *Cing'ig* area (apparently the habitat is good for cod, but also she may have referred to the geography - the boulder beaches and numerous rock points where fish could be dried).

Further south, on the next major point of land (USGS Cape Corwin) they arrived at another spring camp, *Nuuteqermiut*. She described it as "a place where many cod were gathered," where the residents jigged (*manartut*) close to the shore from their kayaks. She recalled the fish entrails were collected (disposed of) in rock pits, but at the time the tides were very high causing entrails to be scattered all over the beach.

Continuing around Cape Corwin and heading westerly the next place they arrived was *Naruyatulirmiut* (USGS Nakooytoolekmiut). Nan described it as a well-populated spring camp (sealing?) of the ancestors, whose residents would also jig at *Nuuteqermiut* for Pacific cod. From *Naruyatulirmiut* they continued to the settlement of *Paamiut*, located in a sheltered location where a large estuary fed by the river of *Paamiut* empties to the sea.

In spring the residents of *Paamiut* would net for seal at *Nuuteqermiut*, followed by cod fishing. In summer *Paamiut* was essentially deserted as the residents retreated inland to the head of the estuary in pursuit of chum salmon at the river of *Kiiwigmiut* (aka *Paamiut Kuigat*). Nan stated that some people stayed deeper inside the bay because they didn't possess boats (to travel to more distant places); they moved farther in although rocks and boulders were numerous and presented an obstacle in the river and estuary. It was only a matter of traveling a relatively short distance from *Paamiut* for them to gather dog (chum) salmon at *Kiiwigmiut* and other nearby sites. Her uncle's parents (or possibly her husband's parents?) had a house as well as fish racks deeper in the bay and also a food storage cache.

Nan indicated those features resembling houses at *Kiiwigmiut* were mostly food storage caches, suggesting large quantities of chum were taken. When they were finished at *Kiiwigmiut* (and in more recent times also across the river from it at *Englulluguaremiut*) they again moved farther out towards the mouth of the bay to *Paamiut* to spend their winters, leaving the fish behind in storage.

Plate 32: *Nunarrlugarmiut*, June 2005.

Apparently the same pattern of seasonal movement was followed in the next major estuary/bay to the west (*Nunarrlugarmiut Taciat*), where the winter village (*Nunarrlugarmiut*) was located closer to the ocean while further inland along the estuary were food storage caches, houses and fish racks at the sites of *Kuigglugarmiut* and *Iqangmiut*.

Situated between *Nunarrlugarmiut* and *Paamiut* the island group dominated by *Qikertarrlugar* was also identified by Nan as a place where Pacific cod was harvested. Nan's older brother Jack identified the same island as "a place for drying cod" (Williams 1991a).

Nan concluded her account of the journey by telling about visiting the village of *Ciguralegmiut* at Cape Mendenhall from their camp at *Nuuteqermiut*. The purpose of the trip was to attend and participate in a spring messenger feast and dancing festival, she said, "I came to awareness at the height of dancing." It was a large village with many residents:

> That particular place gathers so much Pacific cod that the land point is whitened with [drying] cod. Without question, that is a large community, your [interpreter Amos] relatives and your ancestors were part of that population. I will not have too much information for that place, but what they gathered, Pacific cod. I don't know their activities; I have never resided there. I can't even [say anything] past [south and west of] that place either. But [I know] those who gathered chum salmon on the other side [possibly *Mecagmiut*].

***Cod fishing at Pengurpagmiut (Cape Etolin) 1920s – 1930s, Susie Shavings* (summarized)**

Susie stated her family's spring regimen was similar from year to year when she was young. They moved from *Mikuryarmiut* (Mekoryuk) to seal camp at *Pengurpagmiut* (Cape Etolin) in March when the weather was good. Sea ice was still present and they walked across the estuary on the shore fast ice. They stayed in the Cape Etolin area hunting bearded seal throughout the spring season. Then, as summer approached they remained to fish for Pacific cod without returning to Mekoryuk. Sometimes the snow melted late and was found in and among the rocks when they started fishing for cod, but the sea ice was gone. The men only had kayaks, it was before open boats were available; it was, she said, a very difficult time.

From the northern tip of Cape Etolin a rocky reef (exposed except at high tide) named *Tevner* extends toward the west for about ½ mile (.8 km). Immediately below the interface of the rocky reef and the vegetated land the fishers pursued cod, first by test fishing (described later). The men went out in kayaks and jigged very close to shore in calm seas.

After a period of absence they returned with kayaks full of Pacific cod. Each unloaded his catch and a meal of fresh cod was prepared for them. Following their meals, they stayed for a short period, rested, and then went out again. They stayed out for quite a while and again filled up their kayaks. Some tied their kayaks together, increasing their stability and minimizing the risk of capsizing (Plate 34). The danger of capsizing increased with sudden or unexpected movements associated with pulling fishing line.

Plate 33: Split cod fish drying on rocks, 1927, Cape Etolin. E. S. Curtis photo, courtesy of Jim Graybill.

"*The people I caught sight of as a child used to do that. They were very hardworking as I saw it. They were beyond understanding. The beach area below them was white from drying cod. It was full [of drying cod] to a certain area; to the land point at Cape Etolin where it begins to turn around. The entire boulder beach was coated white with drying Pacific cod. They then went through the neck of land towards Kialiraluar, past the sand dunes. It was whitened with drying Pacific cod; they used to dry a lot"* - Susie Shavings.

Cod Fishing at Cingigmiut and Nuuteqermiut, Nan Kiokun (1st person narrative)

The ones that catch a lot [of Pacific cod] use their kayak as a measuring device. When a kayak is loaded to its maximum, they go back to unload. Then they go back out again; Pacific cod was plentiful. I was a child during those times there at *Nuuteqermiut* and across there as well at *Cingigmiut* [Cape Corwin]. They process Pacific cod from there, […] although the number may be less than twenty a kayak would definitely have a load. They immediately went back to unload to prevent overloading. I believe that Pacific cod carries a lot of weight. Sometimes they returned with a partial load. I actually witnessed them when they went back to go unload Pacific cod.

When the currents began to subside, they went out; they were very close to shore at *Nuuteqermiut*. Fishing took place just below the small isle there [she may be referring to the rocky points or reefs named *Nuwugyarrluggat*]. During my observation […] the (kayak) stern became loaded lifting the bow, then they went back to unload at *Wiwukaaremiut*. The inland end of the village [of *Nuuteqermiut*] is called *Wiwukaaremiut*. They went to go unload at *Wiwukaaremiut*. They threw [Pacific cod] on shore where their wives brought them to [processing place]; then again they went back out. They quickly loaded their [kayak]

again. I'm not sure whether they went back the third time, but usually made a second trip with Pacific cod.

The beach front would turn white with processed and drying cod, my goodness, there at *Nuuteqermiut*. This was at the time they constantly unloaded. Eventually the number dwindled, so catching Pacific cod winds down. Those who believe they have caught enough quit, although they were still plentiful. Those who finally catch halibut are so jubilant. "He caught a halibut" would be mentioned. They were so amazing.

When a [kayak] is waking [plowing through water], it is said that they are fully loaded. "That person down there probably caught a bearded seal, so he has a full load" [would be said facetiously or jokingly]. [People] usually say that when one has a full load [of cod].

I believe that twenty Pacific cod has a lot of weight […] I wonder what would happen to a kayak's stern with fifteen Pacific cod? Fifteen, I believe that the bow would be raised quite a bit with fifteen Pacific cod.

Some fished as much as possible. When they believed that enough is caught they quit jigging. The beach becomes white with drying because of bountiful catch. Then the head, the eyes are poked through with a sharpened wood to noose [thread] a skin line for bundling. The bundled heads are then hung up on drying racks, how amazing!

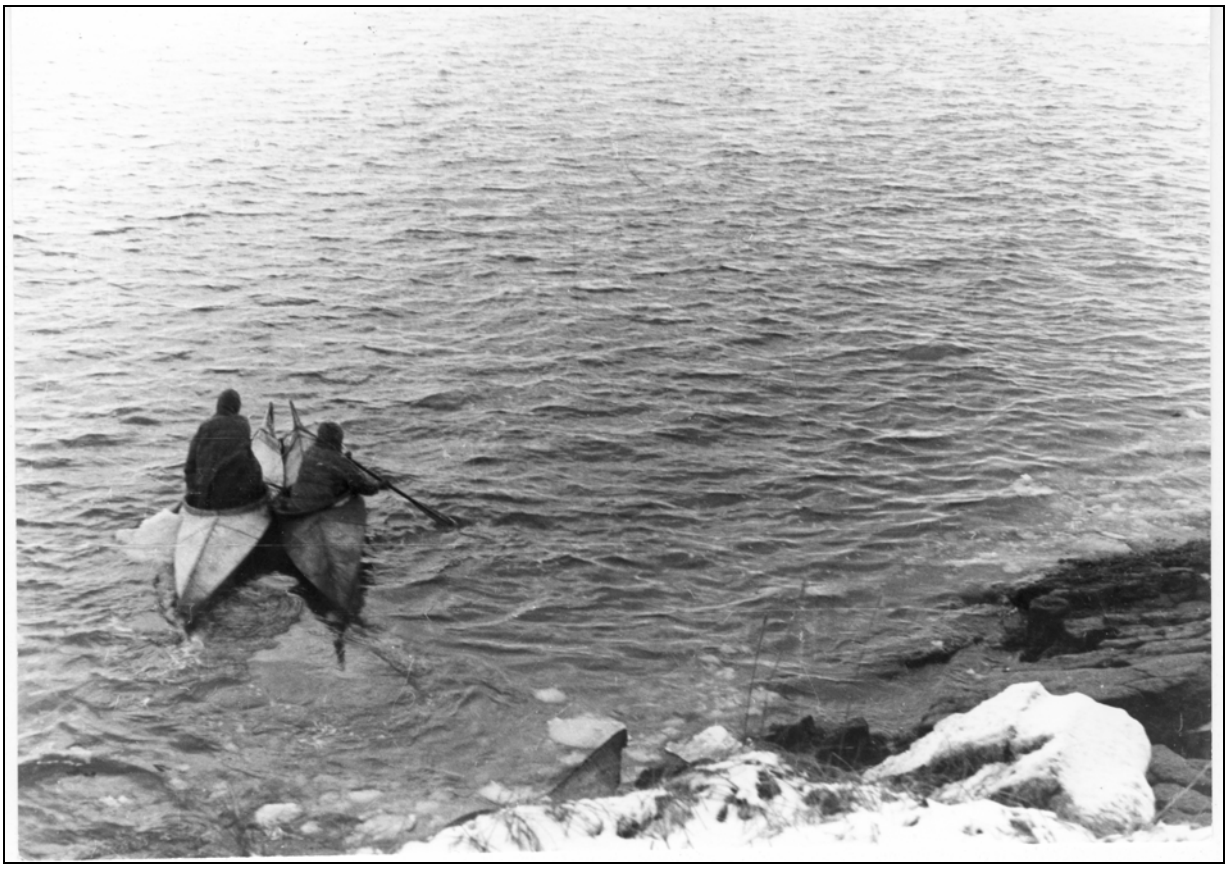

Plate 34: *Ituutarluteng*, kayaks tied together for stability, near Nash Harbor ca. 1937 (Photo: Hans Himmelheber, in NPT collection).

***Historical Distribution of Cod at Nunivak, Ida Wesley* (summarized)**

Ida stated when she was young Pacific cod were abundant and consistently available from year to year - they caught many. Pacific cod were most plentiful at the south side of Nunivak, but they were also abundant in the Mekoryuk area and at *Pengurpagmiut*, where their density was very much the same as at the south side. In the immediate vicinity of Nash Harbor they were scarce, but towards Mekoryuk at *Cingigarmiut*, a short distance from the point (*Cing'ig*) large quantities of cod were caught by the *Ellikarrmiut* (residents of Nash Harbor). Below (*ketitni*, base kete- "area below; area away from the bank; out into river, ocean or bay") Nash Harbor there wasn't much cod taken, the same was true at *Negermiut*; but when jigging offshore of *Cingigarmiut*, which lies between those two places, much more was caught.

Ida and her family moved to *Talungmiut* after her mother, *Im'in*, died. She said Pacific cod was not plentiful there when she was a child. It was caught, but not in large quantities. Also, those that fished below *Qayigyalegmiut* didn't catch much cod. It wasn't as plentiful in those places as at Capes Mendenhall and Etolin. Those at *Cingigmiut* (Cape Corwin area) and those who fish down below *Mecagmiut* also caught a lot.

Ida's father fished for Pacific cod offshore of *Ciguralegmiut* and transported the fresh fish to *Itegmiut* (USGS Etikamiut) where her mother processed and dried them. They fished from kayaks because open boats were not available to them. At *Ciguralegmiut* the fishing grounds were near the shore; men, visible in their kayaks, could be observed pulling up their lines when they caught Pacific cod. They fished when the weather and seas were calm; when it was rough they remained on land. Ida stated, "The wind hardly blew when I was a child. It used to be very calm."

***First Memories of Cod - Nash Harbor Vicinity, Nancy Edwards* (1st person narrative)**

> I became aware of my environment at Nash Harbor. Although some times I was aware and the next I was not, I knew that Pacific cod was acquired. I discovered when I became aware that my parents used to bring cod from somewhere. When a kayak arrived, it was unloaded. They were too heavy for me, but I partially dragged and brought them back. During those days I only carried, not assisting in any other way. I didn't know how to cut fish. My mother used to cut the fish. I didn't know how, she didn't teach me how to cut one fish, (laughter), I think I was too small [young].
>
> There from *Qerrumal^{z}ria*, from the west somewhere, they caught Pacific cod by jigging. The place they fished was quite a way out west [from *Ellikarrmiut*]. Below *Qerrumal^{z}ria* where it is very high is where I believe they fished with kayaks lashed together. I am not sure of the exact location; they fished just below it. Those who fished usually start appearing from that area when they returned home.
>
> They caught a lot and very huge cod fish, the heads used to be large. I used to handle them; I tried to carry them mostly dragging them to the processing area. My parents traveled a lot by kayak. They went fishing, went to get driftwood. Although I was small, I assisted by taking that up. When they brought something, I helped out. At *Qimugglugpagmiut* [Nash Harbor] our house was situated above a bluffy place.
>
> I believe they used to fish there at *Cingigarmiut*, I am not sure of the exact location.

I didn't stay there. During [chum salmon] runs my parents used *Pim'ayug* and *Taciraugar* for catching fish, on the other [east] side of Nash Harbor.

Taciraugar was situated next to *Pim'ayug*. *Paagullria*, John Jones [Plate 12] used to live there. The grave site is his wife and his two daughters. There are three graves there. Maybe it is *Miyaar* [wife's name]. I don't know who the children are. They perished together, probably through measles, something, maybe flu epidemic.

At western Nunivak a somewhat different subsistence cycle was followed. In the fall when they were done fishing and processing fish the people would travel from *Ellikarrmiut* to *Talungmiut* to camp and exploit the bird cliffs. Nancy provided details relating to the processing of bird skins for parkas, but they are not presented in this report.

Eventually the residents of Nash Harbor relocated to Mekoryuk and Nancy was among them.

The residents of Nash Harbor moved here [Mekoryuk] talking about a school, they moved using that excuse. I didn't know anything about this place. I don't know them. They [*Mikuryarmiut*] probably did fish from their village. I did see those who fished for dog salmon, I didn't know anything about Pacific cod here.

***Personal History of Cod Fishery, Joe David* (summarized)**

Joe recalled, at the time he was a child, the residents of Mekoryuk fished for Pacific cod in kayaks, departing from Cape Etolin toward Nelson Island. He observed two kayaks lashed together and relatively close to shore (Plate 34). At about 10-15 years old (ca. 1944-1950), he moved seasonally with his family from Mekoryuk to seal camp at Cape Etolin. They stayed through the seal hunting time until cod fish arrived. He reported the same pattern at Nash Harbor, with Pacific cod harvested right after spring seal hunting. He heard from Edna Mathlaw that cod were plentiful in the vicinity of Nash Harbor and the residents harvested many in the spring, but they hardly took any halibut.

Joe said large amounts of cod were probably taken at *Cingig* (Cape Corwin area), *Talungmiut* and *Penacuarmiut*. He described the location of the *Penacuarmiut* fishery:

When one goes out of *Mecagmiut* [bay] we departed in that direction [toward *Penacuarmiut*], we went directly west. Then when *Talungmiut* is in view, the hill above it, then we anchored [with that view in sight]. It was not very deep either.

Joe fish camped at the estuary of *Taciqvag*, his sister also camped there (time frame uncertain) and together they caught "some halibuts and few cods."

***Southeast Nunivak, Paamiut to Nuuggavluarmiut. Hilma Shavings* (1st person English narrative)**

At the time that I was born, the island had several areas where individual families lived. Where I came from is on the south side of the island called *Paamiut*, or *Cuqucuryarmiut*, which is past Cape Corwin. That was where my parents lived and they said that's where I was born, that place called *Paamiut* and *Cuqucuryarmiut*.

In those days, families, because of the subsistence life style that they have, they stay in certain locations where the fish are in summertime. In springtime, somewhere around April

they moved to a place called Cape Corwin, *Nuuteqermiut*, that's where they do their seal camping for hunting seals; seal oil and dried seal, seal meat and stuff like that. I'm not too sure if they harvest any cod in that area. I'm not too sure, because I was very little.

The year I was born in 1935 and after the school was established in Mekoryuk [ca. 1940] my parents took me there, to my grandmother, so that I could get an education. And they moved further to place called *Qaneryagtalegmiut*. It's a place not too far from where they did the herring camp, Talking Village (*Qaneryagtalegmiut*).

They moved further up so they can be closer because I'm going to school in Mekoryuk. Being the oldest my dad wasn't allowed to have an education when he was young, and he didn't want to deprive me of the education that he couldn't get because his father wouldn't allow him to go to school. So he allowed me to go to school and then they moved further up [the coast from *Paamiut* area].

I remember that herring camp, there's an island there *Nuuggavluarmiut* [Hilma verified this with Henry], I guess there used to be sod houses and a spring camp there. Sometimes when you are small you go in and out. You remember things and you black out again. I remember my oldest brother, he's really my dad's oldest brother's son, he's really my first cousin, but my dad took him when his dad died. He raised him so I called him my oldest brother, Bob Edwards. He took my father's first name as his last name, Edwards. I remember him. In those days they used to have kayaks, he goes down there [in the strait, out from *Nuuggavluarmiut*] and does the hooking and they, he come home with a lot of cod fish. Those were the, I guess those were the *real* cod fish. Must be in early '40s, I was pretty small, I was in and out. I remember that big catch, both kayaks were just packed full of cod fish.

Availability, Seasonality, Habitat and Harvests

Fishing Cycle

George described the traditional subsistence fish cycle at Nunivak as follows: in spring, beginning in May as the ice cleared Pacific cod were taken. Next, sometime before July, before the arrival of chum salmon, trout (*irunar,* Arctic char) were pursued. "Trout" may refer to both Dolly Varden (*iqalluyagar*) and Arctic char; however, it is possible that char were caught in early summer and Dolly Varden later in the summer. In July, fishing for chum salmon occurred, followed with flounder and by September silver salmon. Lastly, and beginning in fall around October, saffron cod were taken and remained a staple throughout the winter months – caught through the ice by jigging with single hooks.

Certainly other fish were taken opportunistically. For instance Helen stated that on rare occasions "small fish" (possibly eulachon or smelt) were caught (presumably in late summer) with a seine net. Elders spoke of bottom fish - notably sculpin, rockfish and halibut - that were taken incidentally during the Pacific cod fishery. Robert Kolerok (1991) discussed taking blackfish during the months of October and November in the vicinity of *Penacuarmiut*,

> When we arrive to *Penacuarmiut* my mother gathers a lot of blackfish. My parents used a seine net to catch Dolly Varden during our stay there. They fished a lot for that species. It

> actually was about that time of the year. It was also toward the end of October, when the ground cools off they [blackfish] emerge.

Fish were also scavenged. Nan, Susie and Ida each recalled the gathering of dead cod from the beaches in summer and fall was a common practice.

Nearshore and Offshore Fishing

In the earlier period (pre-1950) *Nuniwarmiut* typically did not venture far from shore to pursue Pacific cod. According to George they generally camped close to their fishing grounds and near the beach. Fishing from kayaks occurred only when the sea was calm. Gentle winds and waters were required in order to lessen the hazards of the surf; the risk of capsizing was too great and the sea and air temperatures were very cold when cod fishing was at its peak. Joe stated that they did not jig for cod in the open ocean because they did not have small boats. Some elders associated the nearshore influx of cod with high concentrations of spawning herring, believing the cod fed heavily upon them. Ida stated herring were not gathered in abundance, perhaps (she speculated) because they lacked efficient gear. She said dip nets made from sealskin that had been sliced and woven were used by some whom she described as "fortunate." She also saw grass pack baskets (*kal^{z}ngag*) used as dipping nets for capelin (and presumably herring).

According to Nan cod were abundant at *Nuuteqermiut* and the men jigged there close to shore. Susie and Joe both described activities at Cape Etolin in much the same way. Susie recalled the cod fishers were very near the shore and could be heard clubbing the fish after landing them. Conversely, according to Nan, those who fished near *Nuugavluarmiut* traveled further out into Etolin Strait and harvested fewer fish. In more recent times (probably in the late 1980s or early 1990s) she and her husband (Edward Kiokun, 1903 - 1998) attempted to fish in the vicinity of *Nuugavluarmiut* but caught few. Joe said he and his relatives, in more recent times, sometimes fished about a mile out from *Pengurpagmiut* toward Nelson Island.

In order to ascertain the arrival and strength of the Pacific cod run *Nuniwarmiut* conducted test fishing (*paqtaareluki*) in nearshore waters. Testing began as soon as the sea was clear of ice, usually in late May or early June, but sometimes earlier. Joe David said test fishing was also necessary in the early season to determine how near or far the fish were from shore.

Ida described a typical early season scenario at east Cape Mendenhall where Pacific cod were anticipated as soon as the sea ice cleared. When sea and weather conditions were favorable one individual would periodically paddle out check the ocean currents and test fish, "Just like us (today) when tom cod (*iqalluar* - saffron cod) fishing we are sensitive to conditions of the tidal current, just like that." Before catching Pacific cod they often caught sculpin and "ocean flounder (*naternarnar*)" and returned home, where the fish were processed for drying. Other men observed the test fisher and took note of his catch as they made their own preparations. When an individual caught two Pacific cod more men would go out.

Susie and George described scenes among the residents of *Pengurpagmiut* and *Qengartaaremiut,* respectively, which mirrored those described by Ida. Early in the season cod availability was sporadic, but the fish soon became very abundant. Once they began catching cod in significant numbers they jigged avidly, filling their kayaks and returning to shore when they were fully loaded.

As previously mentioned some men lashed their kayaks together to improve stability. At *Ciguralegmiut*, according to Ida, men fished singly, but as a precaution, in close proximity to one another. If a large halibut was caught two kayaks approached and the three kayaks would lash together. After it was killed the halibut was loaded, brought ashore and unloaded with the help of the assistants. The helpers immediately departed and returned to their jigging. Hilma also recalled men fished alongside their partner in separate kayaks. Ida was the only interviewee to mention offshore anchoring of kayaks with large rocks.

George estimated a kayak load at 15-20 fish, stating, "Although we wanted to catch more, our kayaks were small and nothing like open boats." Hilma could not say how many cod would constitute a fully loaded kayak:

> Seems like every male in those days was supposed to have a kayak…They're pretty big fish and the Nunivak kayaks were pretty good sized; I guess they are the biggest kayaks in the entire area. I remember they load 'em up all the way to the tail that side of the kayak, and then even fill the front, and then they come home. The kayak was just almost in (under) water. So, both of the (partners') kayaks were like that. Then they have to bind the kayak with the skin rope, bind them together so it won't tip over. In order to paddle he paddle his side and the other guy paddle the other side. That's how I remember, and I know that's a lot of cod fish then, the *original* codfish.

Ida stated that the *Ciguralegmiut* fishers filled up their kayaks three times in one day with cod. A loaded boat rode low in the water, perhaps to the side rail (*apamar*), at which point they stopped fishing and returned to shore. She remembered:

> Our ancestors used to do that. During the ebb tide and during the beginning of the incoming tide, I saw my parents do that. Others like my grandfather used to do that as well.

Today Pacific cod and halibut are taken using both rod and reel and by hand-jigging. Prudy suggested that the rod and reel method may be becoming more popular, but her boys still fish by jigging with a stout stick or dowel, heavy cord line and single hook.

Pacific Cod in Stream Environment

Most interviewees discussed the presence of Pacific cod in Nunivak streams. According to George, cod were harvested from the rivers and estuaries through the month of July. Fishing sites were accessible without a boat and stream fishing for cod was primarily, but not exclusively, a female activity.

Elders described fishing with throw hooks (*egtarluki*, "we used throwhooks") to catch Pacific cod in the Mekoryuk River. Helen said, "We used throw hooks in the old way; that was how we did it, not with fishing rods." While *egtar* has become adopted for "fishing rod," Helen specifically distinguished between throw hooks used "in the old way" and modern casting by rod and reel.

Peter Smith (1987) described the method: a baited hook was cast into the river and its line secured along the bank with a stick. It was left as a set which was periodically checked. He described it as an old method, employed by his wife Mary Smith, "when she was a little girl" at *Quuyarmiut*, a Mekoryuk river site. George commented that Helen caught large cod using a throw hook, "That is how the women fished. They did this at *Iqiucirwig* below Mekoryuk… when the tide is high."

One place in the Mekoryuk River drainage bears the name *Egtarwig* and was specifically connected to Pacific cod fishing. The site lies about three miles upstream of Mekoryuk, within the area of tidal influence, but is geographically more riverine than estuarial. The name is translated as "place to fish by casting" (Drozda 1998:7) and "where one casts out a fishing line to fish" (Amos and Amos 2003:103). In this context "casting" is meant in the traditional sense, although as previously mentioned, the definition of *egtar* has been expanded today to include fishing by rod and reel.

Susie suggested Pacific cod were following their food when entering the estuary during the summer at Mekoryuk. She and others fished for them just below *Iqiucirwig* when the tide was at its lowest. She believed the cod did not go any further upriver (although *Egtarwig* lies upstream). She also never heard of or experienced cod caught in seine nets when the residents fished the river for chum salmon.

Peter recalled Pacific cod entered many of Nunivak's rivers, while others provided specific examples. As teenagers Nan and her brother Jack (Williams, Sr.) stayed at *Atengmiut* where Pacific cod were abundant and known to move up the river (*Atengmiut Kuigat*). Jack caught them there within the long, sheltered estuary. They did not spawn in the river or estuary, she said.

At *Paamiut* cod also moved up the rivers and were taken at "an area with boulders" (possibly the twin features *Caputnguat*, 'false weirs'; or the boulder strewn beach *Qiut*, 'lichen covered land rocks'). Nan said, "Pacific cod also entered the bay at *Paamiut*. Long after I conceived children, they used to catch Pacific cod from there."

A freshwater spring provided drinking water at *Paamiut*. According to Nan, in the past, but not in recent times, Pacific cod were observed emerging from the spring water where it drains into the *Paamiut* River. She also said they didn't use nets, harpoons or gaffs to get cod from rivers - they only fished for them with hooks.

Finally, Howard recalled his elders telling of Pacific cod entering rivers in older times; he and Prudy also personally witnessed cod in streams and heard similar reports from others during the 1986 return and influx of Pacific cod.

Pacific Cod Feces as Indicator of Fish Abundance

Elders believed the presence of a significant quantity of cod fish offshore was made apparent by large amounts of cod feces (*atgiyat anait)* washing up on the beaches; apparently the feces are rich in oil and float.

Nan, Dorothy Kiokun and Muriel Amos (Kiokun 2005) had a lively discussion regarding the occurrence of Pacific cod feces on Nunivak beaches. Nan stated she had a vague memory of large amounts of cod feces washing up on the beaches:

> I used to hear there will be plenty of Pacific cod when (feces) is large in number. I believe the Pacific cod run will be large. That is what was probably referred to (by elders). When Pacific cod feces are a lot in number, the run will be enormous. I think that is what they meant.

Dorothy supported her:

> I have heard about it in the fall. When a large number of feces are seen on the beaches, I believe there will be a large run.

Muriel and Dorothy asked how the feces looked and Nan described them:

> (They are) circular in shape, small and round, very clear and soft. That is Pacific cod feces. In appearance they resembled a sphere, but because of their softness they were flattened. On the beach, when it is seen, it should be clear and round. Its surface will be sandy. It will be Pacific cod feces; round, but not perfectly so.

Muriel asked if they resembled stranded jellyfish and Nan said:

> Yes, almost the same […] I would definitely recognize it on the beach. They are transparent […] very clear, the Pacific cod feces. Our fathers call them [feces of] Pacific cod.

George was specifically asked about statements made by his sister and others regarding Pacific cod feces washing onto the beaches. He agreed with Nan, described them similarly and provided the following observation:

> They use to identify them, and Helen knows them too. We know that Pacific cod will become numerous by its feces. That is how it is. When I was a small boy and saw feces on the beach, I didn't know what they were. I really didn't know what they were. So after asking questions, when I saw numerous feces washed up on shore, my mother told me about them. 'Those are feces for Pacific cod. The Pacific cod has arrived and will become numerous.' Helen knows it too. But in our current days they don't arrive as they used to when we were small. They are no longer seen as much on the beaches. They were plentiful anywhere on Nunivak Island. The cod fish (also) is not as numerous as before. I don't know why.

Food Shortages Famine and Starvation

Ida stated that when she was a child there were times of starvation. Sometimes people had nothing to eat but tomcod (saffron cod) and they perished because it was eaten without seal oil. Tom cod was considered a reliable resource and important dietary supplement; however, despite its abundance and availability in the winter, alone it lacked certain nutrients necessary for survival.

Ida lamented her youth – a time when sharing was customary. Today, she said, people are accustomed to Western traditions, less is shared and food is wasted. She spoke of the challenges of living in the old days and said food was difficult to gather then because material possessions (like nets) were rare.

> Our ancestors used to say that if a person caught one dog salmon it was a nice catch for the day. One dog salmon that was caught in a day was considered adequate. They were grateful, because it was scarce and gear wasn't available, no gill nets. They also did not have dip nets during that time.

Susie also implied that it wasn't easy to obtain all that was needed because they fished from kayaks and didn't have adequate nets as they do today. Some families were unfortunate because they lacked the resources or material possessions (such as sinew nets) necessary to obtain enough food and stave off hunger. She offered the example of her older brother, Jesse Moses, who told her that their uncle once was forced by hunger to cook and eat a skin net he used for catching seals.

Robert Kolerok also associated earlier less efficient procurement technologies with lean times:

> Prior to acquiring hunting/fishing gear they experienced food shortages. Food was scarce. They also starved and perished… (modern) fish hooks were not available, seine and gill nets were also not available… The ancestors lacked gear.

Table 7: Cup'ig terms associated with fishing and technology.

bait	naryarer
beach seine (verb)	nekvayar-
blackfish trap	can'girrsun
club, fish	kaugutar
cover (verb)	ciruluki iqalluat (verb - cover the fish)
crosspiece (from which a pair of hooks hang)	iqsim canirut'i
deep-sea fishing, to go	iqsag- (eg, iqsagtur, he went deep-sea fishing)
dipnet	qalussun
fishhook	iqsagar
fishhook, large (for halibut, cod or large fish)	iqsag
fishtrap	taluyar
gill net	kuvya (also seal net)
gillnet mesh	negar
hooking, fish with hooks	iqsallrit
jig for fish	iqsagar-; (eg., iqsagartur - he is jigging for fish)
mesh gauge for fish or seal net	negaqerrun
net shuttle	qipauteg
net, to make	kuvyi- (ex. kuvyiur, he is making a net)
net, to set (a gill net)	kuvya- (ex. kuvyaur, he set a net)
net, to set or spread out	civte- (ex. civtur, it is set)
net-hanging needle	qipauteg
netting, netted (verb)	caquter (Olrun 2005; cf. caqutaugar)
pairing of dried fish (notched tail)	inglukeggluk'i
seine (verb)	caqutaugar (noun and verb)
seine net	caqutaugar
sinker	kitar
spear, fish	narulkar
spear, fish (with 4 barbs)	kapuutet
tomcod, fishing stick with ridges on end	nuluraun
woven grass cover	umran (fish cover)

Methods and Gear

Pacific Cod Fish Hooks

Ida and George each offered descriptions of a traditional cod fishing apparatus based on a photograph of a "three-piece cod hook" collected at Nunivak by Margaret Lantis around 1940 (Figure 7). Both elders had direct experiential knowledge of its use and construction.

George said he and others of his generation used the same type of hook assembly and added since metal was unavailable to his ancestors they made composite hooks of ivory and caribou antler. Ida said "I do have one in my house," and provided most of the detailed description, summarized below.

The hook apparatus was composed of three primary parts that could be made of ivory, bone or wood. The upper horizontal member (*iqsim canirut'i*) served as a separator for two vertical hook supports (*iqsangqetullrut*). The components were connected by means of twisted sinew "twine" tied through matching holes drilled in both ends of the horizontal spreader and the top ends of the hook supports.

The hooks were metal (earlier antler, ivory or bone) and approximately as long as the bone supports. The hook had an eye (or was rounded) opposite the hook end. The eye was inserted into a groove carved into the bottom end of the hook support (which can be clearly seen in Figure 7). After insertion the hooks were lashed to the respective hook supports with twisted sinew, and the two hooks hung opposite one another. Ida said:

> It has a groove, yes just like that picture. The hook has an eye, there's a piece here, that a hook is inserted into, and goes down like this and sinew is used to tie it together right there.

A rock anchor/sinker (*kitar*) was suspended from the center drilled hole of the separator (spreader) by a seal skin line so it extended below the hooks. Ida mentioned that a "glue-like substance" (*nepcen'ar*; cf. *nepcanar-* "to be sticky" [Amos and Amos 2003:223]) was used in attaching the anchor line (perhaps the other members as well), but the method and substance was not ascertained. The anchor rock was "quite big" and was not chosen arbitrarily. Ida said, "One searches for a rock that is not exactly round, but that is suitable, my dad did that" (Plates 16, 35).

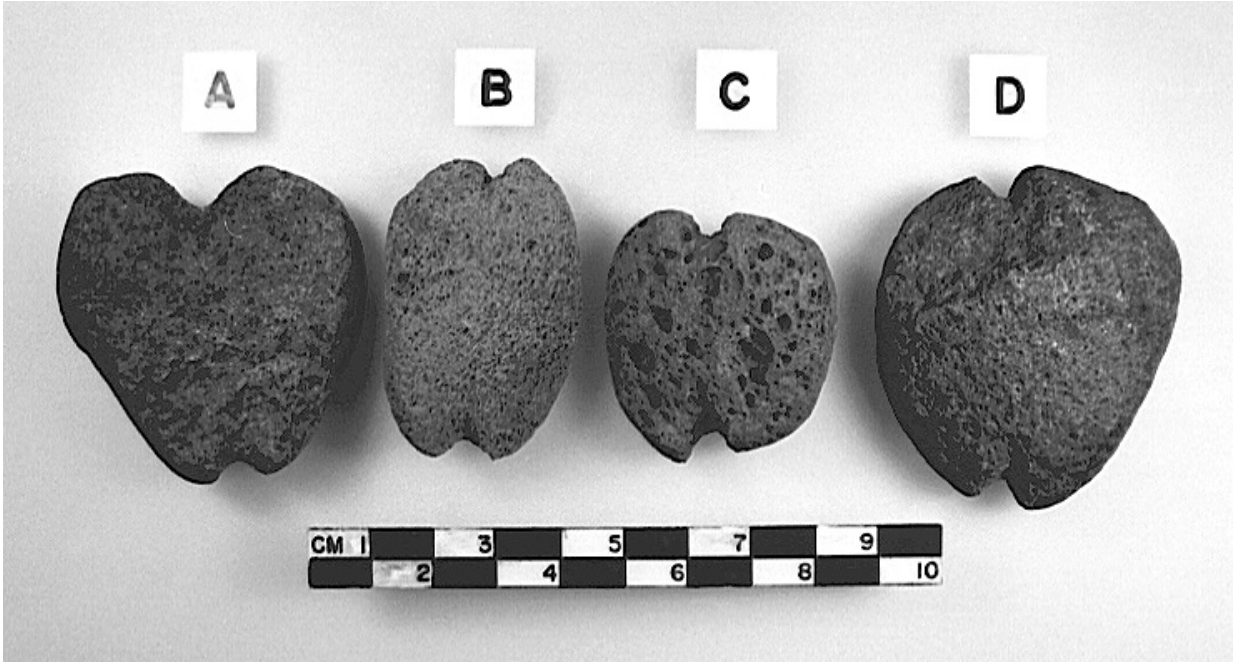

Plate 35: Notched cobbles (*kitar*) from Ida's birthplace (*Ciguralegmiut*). Identified as net sinkers by BIA ANCSA, but may also be anchors for Pacific cod composite fishing apparatus (shown slightly less than actual size, image courtesy BIA ANCSA Office).

The sinker was either directly attached to the anchor line or alternatively a woven or knotted sack was made and formed "just right" onto the rock to secure it and prevent it from falling off (see Figure 9). When they attached the anchor rock directly to the line a groove was first pecked into the sinker to accommodate the line. Ida said that her father made this kind of hook apparatus and taught her how to make one as well:

> when my dad directed me to tap I made a groove […I] tapped, tapped, tapped and tapped (*kaugtuareluku*) [it with another rock]. Then a seal skin line was attached very tight, so that it will not fall off.

After working on the anchor rock in that fashion it was finished, the pecked groove did not require further grinding or smoothing. George's statements largely mirrored those of Ida; he said a large naturally formed stone was kept when found and used as a weight or sinker. The stone would be further shaped by hand, using another rock as a hammer or abrader, as metal files were not available.

The entire apparatus was lowered and raised by means of a fishing line made of sliced seal skin (*pinevkar-*). The line was attached through the same central hole where the anchor line was attached. A handle was also made for jigging. Ida said the same method and apparatus was used for all bottom fish. The line was let out to the bottom [*kalevtaqata*] and one might catch a sculpin if not a Pacific cod.

George also described making the components of the hook assembly. A crosspiece of ivory, antler or bone was first carved to the proper dimensions and then drilled to accommodate the lines, including the anchor line. When they prepared to drill, a bow drill (*kayivqur*) was outfitted with a stone tip. George operated the bow drill when told to do so by his elders. The drill was large, two men would operate it, and the strap was made of skin. One person pressed down and applied pressure while another worked the bow and drilled the hole. George described it as a very laborious and tiring task.

George explained another method of securing hooks to supports. Straight barbs were carved from ivory, sharpened to a point and inset at an angle into a drilled hole in the antler (vertical hook support). The barb was fixed tightly so that it would not become loose. An example of this type from Nunivak is in the Peabody Museum collection and part of the exhibit, "*Yuungnaqpiallerput*: The Way We Genuinely Live, Masterworks of Yup'ik Science and Survival" and its companion publication (Fienup-Riordan 2007:273). The Peabody hook assembly includes a weight made of bone, presumably walrus jaw bone which is known for its density.

George also described the transition to metal hooks - occasionally lumber washed ashore and he combed the beaches for old nails to bend into cod hooks:

> I tried hard to shape them. I bend it (into shape of hook) and attached a line. I'd catch cod fish like that. When nails became available my relatives/friends used them as well. They made attempts to make hooks although (nails) were old. Cod then became plentiful.

Joe described a more modern rig, similar in construction and material to the pictured Koniag apparatus (Plate 36), and another of unknown origin from the UAF museum (Plate 37). As described by Joe the hook assembly consisted of a horizontal cross piece (roughly 20 cm long) from which two hooks were attached by various means to both ends. The hooks may have been suspended on sealskin line or attached to bone. From the center of the cross piece a weight was

suspended and would extend several centimeters below the hooks. The weight consisted of a rock, about the size of a baseball or perhaps larger and incised with a groove like those described by others (above). A line was attached to the center of the cross piece above the sinker line for raising and lowering the fishing apparatus.

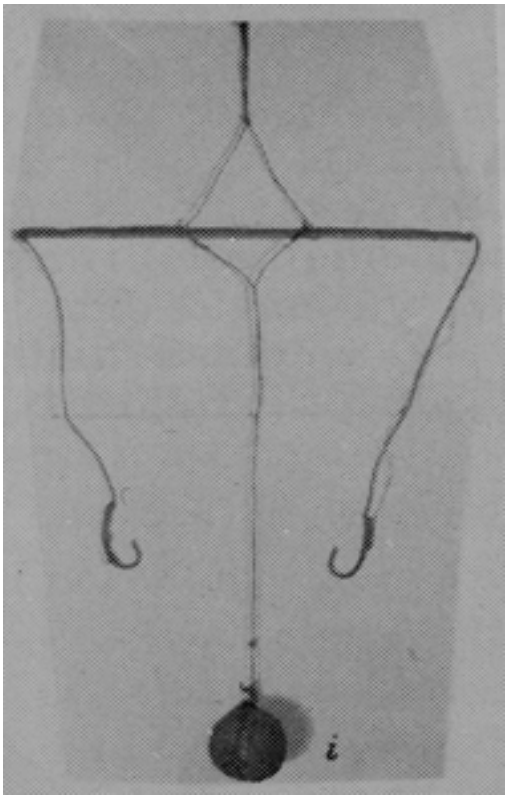

Plate 36: Koniag fishing apparatus (Heizer 1952:16).

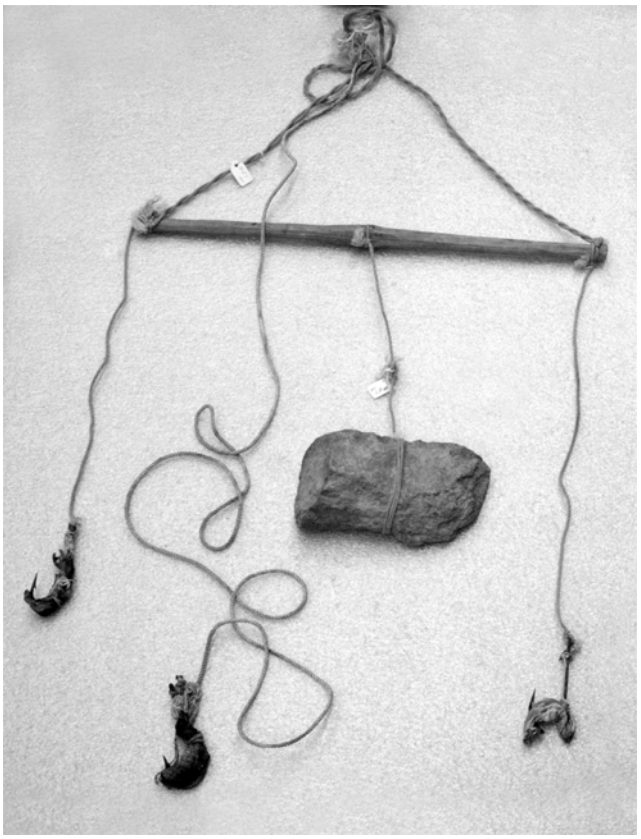

Plate 37: Fishing apparatus, possibly from Nelson Island (University of Alaska, Museum of the North).

Bait and Nets

Flounder was used for bait and according to Ida was preferred as some believed it contributed to greater catches of Pacific cod. Her father also used rock fish for bait and herring was also commonly used; today herring is preferred.

Plate 38: Harry Mike (*Cukiliyagar*) and Luke King (*Kinguiral^{z}ria*), beach seining at low tide, probably in the Mekoryuk River. There appears to be at least one flounder in the net (Photograph by Amos Burg, 1941. Oregon Historical Society, #2011).

Susie said her grandmother used to twist sinew into lines for nets. Her husband made nets of sinew and caught herring with them (according to the 1940 US Census Harry Shavings' household owned three nets valued at $150). Edward Kiokun described *Ciguralegmiut* as a spring camp where the residents used dip nets (presumably shore based) to catch Pacific cod.

Plate 39: Harry Shavings, Susie Shavings and Nona Amos. Lunch break at *Talungmiut*, ca. 1988 (Howard T. Amos photo).

Processing and Storage

> In those days they never waste anything. Nowadays (it's) hard for me to imagine, because we're older and we try not to waste anything, because that's how we were, that's how we grew up, watching our parents save everything. - Hilma Shavings

All of the female interviewees discussed methods of processing and caching Pacific cod. Several described fishing activities and/or processing fish away from primary habitation sites (spring camps or winter villages); while others recalled processing their fish in closer proximity to residences. These were practical choices based on local geography.

Processing Sites

Cod fish were not hung on racks to dry but rather were typically placed upon large flat-topped boulders. The availability of such rocks in sufficient quantity to accommodate large amounts of split cod was critical in the choice of drying location. At Nunivak these were black basalts that absorbed the sun's rays and held heat that facilitated drying. Conversely, the light-fleshed cod reflected light, drying slowly without becoming "cooked." Darker fleshed fish, such as chum salmon is easily "burned" and care must be taken to avoid it becoming spoiled by overexposure to the sun.

Plate 40: The point of land *Usragglit* (middle ground) had sufficient boulders for drying Pacific cod. Beyond the point lies the village of *Ellikarrmiut* (Nash Harbor). An abandoned and collapsed seal cache lies in the foreground (Irving Bird photo, courtesy Joann Arnall Boston, in NPT collection).

The beach at *Ellikarrmiut* (Nash Harbor), while near prime cod fishing grounds, lacked the large rocks that were preferred for drying cod. A short distance to the north suitable conditions were found. Nancy explained:

> In the vicinity of Nash Harbor, but farther out in a place called U*sragglit* is where it is laid onto boulders to dry; on top of (boulders) at *Usragglit*. They used (it) as a place to dry their (fish), because rocks were huge there. When the sun was shining a lot, it was really appreciated for drying the fish.

At *Ciguralegmiut* on Cape Mendenhall Ida stated that the men transported their cod catch to *Itegmiut* where they were processed and dried by the women. While she did not specifically mention the presence or absence of boulders she did say that they felt that the fish dried faster at *Itegmiut* and suggested it was better suited because it was a warmer and more sheltered location than *Ciguralegmiut*.

According to Susie, large quantities of cod were caught and dried at Cape Etolin. The beach there is composed of large, flat-surfaced angular boulders perfectly suited to drying codfish (Plate 33). The entire beach, she said, both north and south of *Pengurpagmiut* appeared coated with white from the drying Pacific cod. The drying area extended from the northeast end of the cape where the village ended then south past the sand dunes and through the neck of land down to the cutoff, *Ekrag* by *Kialiraluar* (Plate 44).

Table 8: Cup'ig terms associated with fish processing.

fish eggs, aged	cinegyat
storage cache, hut for storing fish	ciqlug'ar
herring or capelin, fermented underground	ciss'ur
fish, salted (brined)	culunar
packing or gathering together (of fish, etc.)	katurrluk'i
salmon eggs, dried	kineryat
fish, frozen (or meat)	kumlacir
salmon, dried chum	mac'utalug
tomcod, cooked for breakfast	makiuiciurrlut
fish vertebra, dried	nenerrlug
fish/food	neqa
fish, dried	neqaalug; teggmallug
herring, half dried and fermented	nin'amayag
braid of half dry fish or meat with beach grass	piirrer
Dolly Varden, half dried stored in seal oil in poke	pingcir
fish, smoked	puyuqer
salmon, roe sac crushed for akutar	qamaumar
herring eggs on kelp	qaryat
salmon, aged	qulug
salmon head, aged	teplicir(ar)
fish, boiled fresh	ungllekar
salmon roe with sourdock (*Rumex arcticus)*, cooked	uqnirer
fish, smoked and soaked in seal oil	uqumel^{z}ngur

Processing

The Pacific cod catch was processed by family members, usually women and girls, immediately after it was brought to shore. According to Susie most of an entire day was required to clean, slice and spread the fish on the rocks. Ida described cutting Pacific cod as an enjoyable activity. Hilma recalled that when she was young her mother (Nan) processed all of the family's fish.

> She cuts them and in those days a cod, they don't hang 'em (fish rack) because it doesn't take long for them to (dry). They put them on the rocks so they can stay and then they dry fast from the warmth of the rock… (If they were to hang them, in the manner of salmon) they kind of stretched down, I guess they don't like them like that. They have to be processed right away and they process everything, even the heads, they dry them.

Susie spoke of the chores she was able to help with as a child in association with Pacific cod fishing. She was too young to cut fish but when her mother needed help she would haul the finished raw cod and place it on the rocks to dry.

Prudy's experiences with processing Pacific cod began in the 1980s when she had to learn the skills as an adult. When she first encountered cod she had no idea how to process them. She recalled asking her husband, but he didn't know the proper method either. Her sister gave her instructions over the CB radio, and after filleting them she found that while the meat is thick it dried easily because there was not much oil and fat present. After cutting they hung them on fish racks (Plate

41) or spread them on rocks to dry. None of the elders spoke of drying cod on racks in the earlier times; Joe stated that in the past cod were not hung on racks, but "nowadays you see them on the racks."

Plate 41: Pacific cod drying at *Nunarrlugarmiut*, June 21, 2006.

Prudy and others commented that cod are easily cared for, and very easy to dry. They use the fishes' own skin, which sheds rainwater, for cover, "when it's raining all you have to do is turn them over skin side up," she said. When cod are dried on racks or on the rocks the sun will not "cook" them. Prudy said it is completely different with herring, dog salmon and other red meat fish, where care must be taken to ensure they don't dry too quickly. Regarding large fish Prudy said:

> I guess when it's real big cod they kind of cut the fish, the skin part, to dry, and then whatever's left of the meat they just kind of fillet it and dry the fillet also. And part of the backbone, they dry that and braid it up (with grass) and hang it, so nothing is wasted.

Cod Head and Organ Processing

According to Ida, people were instructed by elders to collect as many cod heads as was possible:

> If we happened to be short of food the cod head would be chopped up into four parts. Also the (dried) gills would be diced into four parts for consumption. We were told to dry cod heads for that purpose… The head was not discarded.

Susie said when the heads were prepared for drying it was a lot of fun (as a child) to pop their eyes out. Braided grass was used to string them as commercial rope was not available. Nancy also recalled stringing the dried heads with attached gills (*pacit*) through the eyes (Plates 42, 43). The eyes were punctured and a rope was threaded through the hole, many were strung together and stored in this manner. Prudy said heads were also put in a row to dry on wooden boards.

Plate 42: *Nuwutneg iingarrlut* "cod heads strung together," Cape Etolin, 1927 (E.S. Curtis photo, courtesy of Jim Graybill, in NPT collection).

Plate 43: Detail, *Nuwutneg iingarrlut* "cod heads strung together."

The women also described processing the internal organs of the fish. Nancy recalled:

> It was spread out to dry on boulders, including the head, gills, also whatever that organ is, under the spinal bone, it is removed and dried, it is called *taqmig'ar*. Taken from where it's stuck right on the spine, airy sac. It is delicious when that organ is removed from the fish and dried. You know, tom cod (also) has an inflated organ, that's what it is, that thing (swim bladder).

Nancy used the term *taqmig'ar* while other women referred to the swim bladder as *qatmag*. Susie said they were hung to dry. Prudy, Susie and Howard all described the *qatmag* color as black, perhaps referring to after it was dried. Ida said the stomach was also washed, dried and eaten when she was a child.

Table 9: Cup'ig terms associated with fish anatomy.

barbel (of Pacific cod)	kaacicar
bladder of fish (?)	taqmak/taqmig'ar (see qatmag)
bone (under gills toward the belly)	keggater
bone, shoulder bone of fish	qutug
diaphragm of cod [colored black (or dark red?)](swim bladder)	qatmag
fin, adipose	nuluraun, amaqata
fin, anal	ucumqatag
fin, caudal	pamyur
fin, dorsal	culug
fin, pectoral	pakiurun
fin, pelvic	pakiurun kinguqlir
fish eggs (roe, fresh or aged)	cin'at
fish skin	amirag
gill	paci
growth, abnormal (in throat of codfish)	iqngullug
milt	erir
milt sac	err'it
otolith (?)	teki (hard white bone inside the cranium of fish)
scale, of fish	kapcir
slime, fish	cuvger

Cod Drying and Fish Camp Activities

> When we lived at *Ciguralegmiut* I witnessed Pacific cod being caught by jigging. All was dried. It was the same here at Mekoryuk and *Ellikarrmiut*. – George Williams, Sr. (1991)

Susie provided one of the most detailed narratives on the process of drying and caching freshly caught cod at *Pengurpagmiut*, the spring camp of the *Mikuryarmiut*. As stated earlier the residents generally did not return to Mekoryuk until after the cod fishing season, instead they remained at camp where they processed the fish and tended it until it was fully dried and placed in caches.

According to Susie, they were rarely idle at camp. In addition to fishing and processing many other chores demanded their attention. She described some of their activities (translated from Cup'ig and summarized):

> The women would gather driftwood and carry it on their backs. They collected beach grass with which to cover the drying cod. To gather grasses they crossed *Ekrag* (water gap at Cape Etolin) at low tide when it was dry (Plate 43). They stayed for a full tide period of approximately 6 hours cutting grass at the sand dunes for use as *umran* (covering for the drying cod, Plate 13).

Plate 44: Cape Etolin view to North toward *Kialiraluar*, *Teggsagar* and *Pengurpagmiut* showing the water gap *Ekrag* (photo courtesy USFWS, Yukon Delta National Wildlife Refuge).

After transporting the cut grass (*taperner*) to *Pengurpagmiut* the women braided it and wove mats for covers to be placed over the drying cod. In the evening the drying cod was gathered and stored to prevent it from becoming damp overnight or with the morning dew. Those fish that were still somewhat raw were not gathered but were simply turned over, skin side up, to shed moisture.

Temporary cache pits were constructed by excavating rocks to form a depression. The semi-dried cod were paired together (*inglukeggluk'i*) then piled up into the dugout. They were covered (*ciruluki*) with woven grass mats weighed down with rocks for the night. In the morning, when the air was dry, the fish were removed and spread out again to continue the drying process.

The men were not idle either; they did not only pursue Pacific cod. The skins of the seals they had caught earlier in the season were fermented to remove the hair. They were then staked out to dry on the lower sides of sand dunes, above the pond, *Ciq'aumqur* [var.

Ciq'amqur]; there numerous seal skins were drying. The sealskins the people staked out to dry looked marvelous, very white in color.

They cared for the skins very well. After the fur was removed, the skin was wrung. They used wood to twist the skins with great force, to remove the moisture. After doing that, when it is staked out to dry, it looked magnificent. After it dried, when folded, it was very white. It appears to look like skins that are partially frozen (whitening with natural cold weather conditions), and looks very nice.

Pacific cod was the preferred fish species and they gathered large quantities. Because chum was not available in large amounts from the Mekoryuk River they tried to get as much cod as they could. When they were satisfied that they had an adequate winter supply and that their food caches would be filled, they stopped fishing. They did not waste any of it, only the useless bones were thrown away. Some included sculpins with the cod; they were supplemental and usually stored on the top of their caches (others stated sculpin and other fish were stored inside caches with the cod).

They broke camp in mid or late July, left their fish cached at *Pengurpagmiut* and returned to Mekoryuk to prepare for summer fishing and other activities. Later, throughout the winter, when they hungered for dried Pacific cod, they walked down from Mekoryuk to their caches at *Pengurpagmiut* (a round trip of about 10 miles/16 km).

When I was asked to get some, I used to do that as well. I walked down to the food storage cache, filled up my grass basket with dried cod, including the head. Then I walked back along the coastal sand dunes (across the bay). It was not a great distance going back and forth. That is how (our ancestors) thrived.

Plate 45: Fish drying at Nash Harbor (*Qimugglugpagmiut*). View toward the northwest including the point of land *Usragglit* in the upper right of photo (Irving Bird photo courtesy Joann Arnall Boston, in NPT collection).

Preparing Cod for Storage

Partially dried cod were paired together (*inglukeggluk'i*) by making a slit in the tail of one fish and inserting the other tail, like a tab through the slit (cf. Hout 1966:11). Pairing made for more compact storage and easier transport of dried or semi-dried fish. After pairing they were further dried prior to storage. Cod heads were strung through the eyes, as previously noted. The cod were then ready for storage in earth-sheltered caches.

Because the *Ellikarrmiut* processed their catch away from the village they had to transport the dry fish. Ida described the procedure:

> When it is dried it is stored. (They are) packed on one's back and brought down to a kayak for transportation, packing the dried and paired cod over their shoulders. They are stuffed into kayaks. Men worked very hard (until) a kayak is fully loaded without any more space. They did not possess any other modes of transportation. Only by a kayak, it was brought over there, to the village from *Usragglit*, quite a distance. Then (cod) is stored into food storage sheds. People repeatedly went back and forth bringing up the (dried cod) to their storage sheds. I personally saw these activities.

Fish Cache Construction and Caching Method

Nan stated caches were constructed much like semi-subterranean houses, but without a skylight. Her daughter Hilma said, "They have food caches in the ground. In those days they had it in the ground because I guess it stores better, it's cool."

Ida described storage caches built into the tundra by her father who excavated the earth and made the cache below the surface. She recalled, "That is how we had our storages. That is how my parents owned their possessions." Ida mentioned large quantities of Pacific cod were stored and storage caches were filled to the maximum. Other ocean species - sculpin, rockfish, flounder and capelin were also stored with Pacific cod. She said:

> Storage caches (*ciqlug'at*) were filled almost to the ceiling with fish, mixed fishes. I don't think they were that big, the mud (storage) houses. One is capable of crouching inside. Those who are tall had to crouch inside the storage cache. Because I was small they were just right for me.

Nan agreed:

> (The cache) is filled with (dried fish), that will be their source of food for the winter. Pollock and Pacific cod are dried like that.

Susie recalled a cache her husband constructed at *Pengurpagmiut* which they managed to fill with Pacific cod. She implied that the fish kept better when it was preserved the old way, saying, "It is not like today where we have to chew so hard."

Nan described details of traditional cache construction, summarized here:

> Fish storage caches (*ciqlug'at*) were built similar to semi-subterranean houses. Typically they weren't big, although some could be as large as 10 x 12 feet (3 x 3.6 m), if the builder had enough wood. You could stand up inside of the larger caches. They were not built with arctic entryways (*laaturer*). Unlike houses the entrance was built at an angle and would be

sealed with horizontal wood pieces. The floors and walls were of packed sand; there were no floor or wall boards. Prior to storing the codfish a smoky fire was burned inside the underground cache to cleanse it and absorb the dampness.

Patches of gathered tundra, specifically that upon which crowberries (*paunrat*; *Empetrum nigrum*; "blackberry") flourish were placed onto the bare earth walls and held in place by wooden pegs. The sod-covered wall was then overlaid with dead grasses, especially in the corner junction of floor and wall, and finally woven grass was placed over the other layers to keep them in place. They ensured that the dirt floor and walls were covered. Loose grass was laid down as a first bedding layer and covered with woven grass mats.

Finally, after preparing the cache the dried cod was stored. Dead grass was gathered and used for mats beneath the fish. The dried fish was placed in the cache carefully, skin side up, so that it will not become damp and rot. Woven grass mats covered the dried fish. They gathered them and laid them down carefully onto the cache bedding. In this manner they were packed together (*katurrluk'i*) [Nan also used the equivalent Yup'ik term, *qungaggluki*] and covered with woven grass to ensure tightness; because they do not freeze anything.

It is filled with (dried fish) that will be their source of food for the winter. Pollock and Pacific cod are dried like that. After the dried fish was covered and acceptably stored a square door was placed and secured with wooden pegs to keep it sealed, over which a woven grass cover was secured with small pegs.

Horizontal boards were fitted over the doorway and the gaps and edges were well sealed with grass. Heavy rocks were placed on top of the boards to keep them in place, to maintain the seal, and to keep dogs from entering. The content of the storage shed was valuable and critical for survival; therefore great care was given to the proper construction of the cache and to the secure storage of the fish.

Nan stated that the same caching method was used in the past with dried dog salmon.

Culinary Aspects

Elders voiced their preference for the taste of Pacific cod fish over other species. Ida stated that when jigging for bottom fish of all the species that might be caught they preferred and primarily targeted Pacific cod. She said the ancestors fully dried cod, it wasn't fermented. Prudy said that the meat is thick and dries easily because it contains little oil and fat. In the above sections the importance and method of drying cod was presented.

Cod heads

The part of the cod most prized was the head, it was eaten fresh or dried but was not fermented. Prudy stated when dried they have a natural salt taste. She surmised that the cod heads were good for drying because they were large and not as fat or oily as salmon. Salmon heads were not dried but only made into *teplicirat* (fermented, aged salmon heads; stinkheads). She said:

> You have to dry the head. When you look at the head, dried head, it doesn't look like it has much meat in it. But you'll be surprised if you eat them, you'll get full. Our ancestors

> learned to preserve food like that. When they're dry they are very hard, they get very hard unless you keep them in a cool place. They're hard but they're good, they have different flavor from dog salmon.

Internal Organs

Precisely which internal organs were used and exactly how they were prepared is unclear. The stomach, gall bladder, swim bladder and *qil'ag* (English unknown, literally "sky") were all mentioned by Nan. The dried swim bladder was described by Nancy as "delicious." It appears the use of fish organs as food has changed over time; some internal organs highly valued as delicacies in the past are apparently no longer appreciated or considered worth the effort to process.

The cod stomach (*anrutar*) may still be considered a delicacy. Ida said that when cod were plentiful the stomachs were set out to dry. They don't dry easily but the product was worth the effort; apparently it is no longer dried. Prudy said (in more recent times) it was not dried, but was eaten fresh, boiled and savored. It was especially tasty and prized. Hilma said:

> They gut 'em and they save their stomachs, there's a certain term for the stomach part, *anrutar*…they save that and they cook it. They save the liver too, I know they did, but I really don't remember. A lot of it is not wasted.

Hilma seemed uncertain with respect to the eating of the liver, whereas Howard and Prudy agreed they do not eat the liver; it was discarded purposely along with the "entrails" of the cod. Prudy stated that the liver is large and she never did try eating it. Ironically, Howard recalled they were forced to have commercial cod liver oil in grade school; he said it tasted awful but teachers claimed it was good for them.

Cod Eggs

While cod roe may have been eaten by the older interviewees they did not mention doing so. Susie specifically did not recall seeing roe with Pacific cod. The younger interviewees had little to say as well about cod eggs. Joe said he didn't know anything about it, "I don't even know how the roe looks like," he said. Prudy said, "I don't know (if they had eggs). I know that they probably do, I was too little to remember all that." Both Prudy and Howard said they hadn't seen cod eggs. Prudy referred to a "sack of something, maybe those are the eggs."

Salvaging Fish

In the past, according to Nan, large numbers of cod were routinely found dead on the beaches in mid-summer and on into fall. Despite pecking by gulls they were gathered and considered very delicious. Today dead Pacific cod are very rarely found on the beaches.

Changes in Quality of Fish

Nan believes the Pacific cod of today are a different fish than those she knew previously. She said:

> To me everything is not the same as it used to be. Everything used to be very tasty. Pacific cod heads were delicious, (cooked) bones were very good to slurp. There is something wrong with them now. I say to myself, '[…] have they altered its meat. Why are they

> different now?' They are definitely different, Pacific cod used to be very delicious. People say, especially of Pacific cod head, 'they used to be very delicious.' Even the stomach was delicious. When one prepares a meal, Pacific cod head was always cooked, including bones with small amount of meat. They were so delicious.

Nan's daughter Hilma also implied - by her use of the terms "original cod," "first cod" and "real cod fish" - the Pacific cod of today was somehow different.

Utilitarian (Non-Food) Uses

Interviewees knew of no non-food purposes for the cod, although Susie did hint that the *qatmag* may have been used as a kind of decoration on clothing, including seal-gut raingear. She said unlike salmon the skin of the cod was not made into clothing or anything else. Ida said the bones were discarded and she never heard of Pacific cod used for any purpose other than food.

Disappearance of Pacific cod

Elders interviewed for this project all agreed Pacific cod were an abundant and predictable resource and an important element of the *Nuniwarmiut* subsistence regime during the first half of the last century. Interviewees also agreed that the resource became completely unavailable by the late 1940s and remained absent until the mid 1980s. This section summarizes their statements regarding time frame, causes and effects of the disappearance of cod.

End of the Cod Fishery

Nan stated that although Pacific cod had been abundant and reliable, suddenly people quit catching them, but they continued to take halibut and pollock. She said, "As time progressed, not too far in the past, Pacific cod disappeared." Susie said the disappearance of the Pacific cod occurred rapidly and was complete; there was no report of anyone catching any Pacific cod. And Hilma and Henry agreed, "It completely disappeared."

Susie reported formerly cod were so plentiful they frequently washed up dead on shore in the fall when storms created rough seas. Those who found dead cod retrieved them for consumption; today they are rarely seen washed up on beaches. Ida agreed and she recalled her mother instructed her:

> if a seagull has pecked on it and (it) has flesh on it, collect it; […but] after it became very scarce, when I was wandering on a sand beach, I ran across (dead) Pacific cod only four times (in one season). After that there was nothing, I never found dead cod washed up on shore.

Nan was the only interviewee to speak of natural fluctuations in Pacific cod populations. While availability may have varied from year to year, apparently a complete loss of the fishery was unprecedented, she said:

> That is how I have heard about Pacific cod before. It is the same for anything, that in certain years it is hard to get. That is what happens in nature, sometimes things are hard to get. Fish was also mentioned like that for certain years. I believe they are plentiful this year (2005). They definitely come short and are not plentiful (in other years).

Asked if Pacific cod populations fluctuated in the past both Howard and Prudy stated emphatically that they never heard any stories from their elders regarding wide variations from year to year. Both believed their parents and elders had successfully fished for cod every spring and it was a dependable and predictable resource. Howard considered the possibility that other elders might report differently, "but I've never been told by my parents that, you know, that was the case."

Some of the interviewees were asked if they had any ideas about why the cod disappeared. Susie did not know or speculate as to what caused them to vanish. Howard asked Nan specifically if she thought the Japanese fishing fleet was in the area when the cod disappeared and she believed yes, it may have played a role in the disappearance. Joe was asked if he thought the Japanese trawlers overfished the Pacific cod and if that was the reason they disappeared. He said he had thought about it and believed that was what happened, although he never heard if that was true or not. He recalled an incident of witnessing a large foreign fishing vessel offshore at Cape Mohican, probably after cod had already disappeared.

> I think the Japanese fished them out, if I remember right. I know one time we were flying with the fish and game, me and Henry Ivanoff, looking for the reindeers, we were on Cape Mohican. We saw a ship down there, way down, right straight from Cape Mohican. So the pilot, he's way up there he went down and they were pulling some big huge halibuts. He just circled only once. He might get shot or something he says. Man, huge halibut. I know exactly it's about ten miles from the point of the Cape Mohican, way down, straight west. We were way up but I know it is a foreign ship.

Henry Shavings said there used to be many cod, but after bombing in the Aleutian Islands during the Second World War (WWII, 1942-43), they began disappearing. Hilda reiterated that they connected the bombing activity to the disappearance of those "first" cod. Henry also said there was also a lot of submarine travel around Nunivak at the same time. He and Hilma suggested the bombing and submarine travel had something to do with the cod disappearing. Hilma also referred to a mass die off of fish around that time; these however were not Pacific cod:

> I don't exactly remember but when those fish were washed ashore dead those were some *kayuq*'s (sculpin), and those little, I don't know what those are called, they're little fish like this with fin all the way back. We call 'em *amqel'aq* (rockfish sp?). Those were the part of the ones that got washed ashore, and tomcods. I don't exactly remember what other [fish?] that my mom and them were picking them up salvaging them.
>
> Maybe it's just us that feel that WWII had something to do with the disappearance. I know in those days they couldn't have fished them out. Because they didn't have the same equipment like nowadays, all they did was just hook. They didn't have long lines, no nets, nothing. For them to disappear all of a sudden, just a few people from the island couldn't have fished them all.
>
> I don't know whether my parents think that (WWII) has anything to do with it but, I kind of figure so because of those, the dead fish that washed up in the Talking Village (*Qaneryagtalegmiut*) area. It was about that time. So that's how I was thinking about it, that World War II had something to do with the disappearance.

Impact of Loss of Cod Fishery

When cod disappeared hunting and fishing became difficult, people became hungry. The following year many people were short of or without food. Ida said that people thought, "I wonder who has this or that (food). I wonder who has any cod?" Her parents became distressed.

Other bottom-dwelling fish mostly remained consistent. Ida said ocean flounder (*naternarnar*), yellowfin sole, rock fish and sculpin were still harvested, but they were never available in the same quantity as Pacific cod and could not make up for the lack. Hilma said:

> The only one that they catch in those days was halibut. We think because halibut can go down to the sand and hide. But cod was vulnerable because they swim all the time. At one time people were catching lots of cod, then they had to adjust, all they caught was halibut.
>
> Even those *kayurpag*, Irish Lords, those big ones, sculpin, the big ones. Those became very scarce too. Every once in a while they will catch them, when we do we thought that was a treat. But the small *kayug*'s, *kayurrlugar*, I guess those survived because they mostly are in closer to the shore, not like cod fish they never travel long ways. So, like tom cods those didn't disappear either. Because I guess they lay their eggs in the protected area; I never (before) thought about that! I never thought about those big Irish lords, that they got really scarce too, maybe for same reason.

By the time of the Pacific cod crash "traditional" *Nuniwarmiut* subsistence methods were changing and incorporating western technologies; open boats, small horsepower motors and commercial nets were available to some. Subsistence patterns were also changed by settlement concentration at Mekoryuk and Nash Harbor. Susie's family no longer focused their chum fishing activities at the less productive Mekoryuk River, instead they traveled to the southern coast where chum were more abundant. (The interviewers did not determine whether Susie's family began to travel to the island's southside for chum while cod were still available up north; it is possible that their subsistence focus was already changing to a certain degree based on access to new technologies and more efficient gear.) Susie also blamed the effects of outboard motors (perhaps in more recent times due to the location of the harbor) for the ensuing lack of fish in Mekoryuk Bay (Shoal Bay, *Mikuryarmiut Taciat*).

Determining Dates

Relative dates ranging from the years 1944 to 1950 were arrived at for the collapse of the cod fishery. Dates were based primarily on major life events provided by interviewees. Susie referenced the time to the birth of her children Jim and Lillian. Following their births cod were no longer seen; with the help of Howard and Muriel she estimated the date between 1945 and 1950.

Ida recalled the collapse coincided with her daughter's birth and the building of the church at Mekoryuk; the date was determined at 1947. Ida said that after she gave birth they went to Cape Etolin where her husband jigged for cod:

> During that time, when her [Amy's] father was jigging at Cape Etolin he caught a lot. […] he tried again [possibly the next year, but maybe later the same year] and he did not catch as much. So during that time Pacific cod at Mekoryuk became scarce […] I believe it was around that time [1947-48].

Nancy provided the latest date, using her marriage as a time marker:

> I believe I have correctly estimated the time of their disappearance, after I got a husband, 1950, but I don't know the month when I got married. I didn't pay attention to it.

Joe estimated the last time he remembered catching cod he would have been about ten or thirteen years of age (ca.1944-47). It is also possible that the fish disappeared from some areas of the island earlier than others, although no elders spoke directly to this point.

Reappearance of Pacific Cod

A Strong Comeback

In 1985 Pacific cod returned to Nunivak after about a 35 year absence. Susie recalled the moment in the mid-1980s when her son Sam (Shavings) was fishing, probably for halibut, at southern Nunivak; she wasn't certain of the location but thought it may have been around *Ciguralegmiut*. Sam caught a fish he was not familiar with, so he contacted (by CB radio) his uncle, Edward Shavings and described the fish to his uncle who told him, "it's a good fish." According to Howard, who told the same story, word quickly spread at Mekoryuk and a rush (that included him) ensued to the southern part of the island.

Sam Weston (personal communication) of Mekoryuk said he was fishing at southern Nunivak in the mid-1980s when he caught many large codfish. They were abundant, he said, so he radioed by CB to fish camps and also to Nightmute. He said the Pacific cod disappeared originally sometime after WWII and this was the first time they had returned since then.

Prudy and Howard each spoke of the strength of that run. Prudy was with her family at their south Nunivak fishcamp, *Mecagmiut*, when they began catching cod. It was the first time in her adult life she had seen Pacific cod. She recalled there were many fish that year, "When you dropped your hook with two hooks, you catch two at a time sometimes." Howard and Muriel were fishing near *Qengartaaremiut* about the same time. Howard said:

> When Pacific cod came back again, when we fished down below *Qengartaaremiut*, they were abundant. Although we didn't bait our hooks anymore, they bit it.

Muriel added:

> There was so many I couldn't fish no more and I had to unhook my boys' catch. I only had time to unhook; and I'd unhook one, go to the other unhook, I kept doing that and my back was really getting tired.

They had a large wooden box on their boat, measuring about two feet by five feet by three feet high that they filled quickly. Prudy said the others in her family were catching so many fish she chose to remain in camp in order to process the large catch. Apparently the Olrun's were the only family fishing from *Mecagmiut* at that time.

Prudy and Howard spoke of seeing Pacific cod in the estuaries and mouths of rivers. Prudy saw them in *Mikuryarmiut Kuigat* and at *Taciqvag*, and heard from others of their presence at *Tacirrlag.* Howard said cod would enter any deep river or estuary, and also specifically mentioned *Tacirrlag*. Prudy used the Cup'ig word *amllerwallratni*, meaning "very plentiful," to describe their numbers at that time. They also agreed the air temperature was unusually hot when they fished that summer. Prudy and the Amos' remarked that the high numbers of cod caught them by surprise, it was

considered a natural event, but had not occurred before in their lifetimes. They believed that the quantity of fish was parallel to earlier times as they understood from their parents.

In the early 1990s Prudy also recalled strong Pacific cod and halibut catches. Her sons (Ron and Leonard) had "their spot" outside of *Taciqvag* where they would consistently catch fish. She said, "They'd be coming home [with] like maybe twenty, fifteen cod at a time plus halibut." Her oldest son used *Talungmiut* and *Cingigglag* as landmarks to locate his ocean fishing spot without the aid of a GPS.

Prudy described fish of different sizes, some were "really big, some small, some skinny." One fish caught by her son was considered quite large, she compared its length to an adult hair seal, or a little longer. The small ones were estimated at about the size of a silver salmon or smaller; she thought that perhaps these were young cod.

According to Prudy, after the initial run in 1985 Pacific cod returns remained strong for several years, but the large influx and harvest did not cause her family to change their chum fishing schedule or goals. She said they were fishing for several families and would "try to catch as much as (we) can." Recently there are fewer cod around the *Mecagmiut* area, she said, "or we don't know where to go." When the oldest boys stopped fishing with them, her husband and two other boys continued to fish but have not caught cod in the same quantity – "Maybe one cod or two" she said, "Even with halibut, we haven't been drying much Southside."

Prudy recalled that one time (no date) at *Asweryagmiut*, they boated in during a very low tide and beached at the first bluff; there she saw one extraordinarily large (dead) cod that had drifted in to the beach. Howard thought that might indicate an abundance of cod south of *Asweryagmiut*. He said it's an area that typically isn't fished now, but may have been in the past.

Relearning Old Ways

When the cod returned Howard and Muriel accompanied his parents to their fish camp. He recalled:

> My mother taught us how to cut Pacific cod and how to handle the head. During the time they disappeared, we didn't even know how they looked like; I didn't know cod grew so huge, first I'd ever seen one.

Hilma said:

> …the younger generation, my mom laughed at the way they try and process. She says that some of the stuff that they dry was very interesting looking. Because they don't know, they didn't grow up knowing how to dry them or how to process them. My mom lots of time laugh. I didn't know how to, (even though) we catch cod from Seward and Homer, I try to dry 'em and I didn't even know how to dry their heads, or how to cut them. So Laura Kolerok's mom (Josephine Shavings) showed me how, she says this is how you do it. And my mom showed me how. My drying was pretty interesting too.

Prudy emphasized her lack of experience with the fish:

> the first time I saw cods were at our fishcamp when they were catching them. I didn't know how to handle that; I didn't even know that I was supposed to dry heads…when I asked my husband, 'How do you cut these fish?' He said, 'fillet them like halibuts,' so I did. But he

> was wrong. I was supposed to try to get all the meat from the bone and cut it up. [Then] I asked my sister, one of my older sisters. I had to talk to her on CB and ask her.

Joe said his wife Margie also didn't know how to handle Pacific cod and Prudy became her mentor.

Not the Same Fish

As previously noted Nan reported changes in the taste of different generations of Pacific cod. Her daughter Hilma spoke on the same issue:

> We moved from the island in 1976, in late 80s and early 90s my parents said that one time a lot of cod came back. But my mom said those are not, these are not the same kind of a cod that were originally caught at Nunivak a long time ago. My mom says that they're not as good as the first ones. I don't know how they were different, I asked her because I never knew the difference. If I were touching them now, I probably would think they came back (the same). But she knows the difference. I don't know.

Glen Ivanoff mentioned that Lindgren Shavings caught a large amount of cod in the spring of 2006 near Nash Harbor where he was intentionally fishing for cod. Hilma again stated that her mom said "those weren't the same kind of a cod that they used get a lot of; she said those are different from the *original* codfish."

The interviewer suggested that the diet of the cod or the environment is different and makes them taste different. Hilma said:

> That's probably what happened. And then my mom used to say, I thought in those days cod used to taste really good. But now it doesn't taste good anymore. It might be something that they eat now, or that make 'em taste different. But it makes me wonder how could cod fish completely disappear and reappear after so many years.

Sockeye (Red) Salmon, *Cayag*

Few Nunivak streams support substantial runs of red salmon and today they are exploited much less than they were in the past. The primary area known to contain sockeye is the *Tuqsug* watershed of western Nunivak where the presence of red salmon is common knowledge among the *Nuniwarmiut*. Ida stated that historically large numbers of red salmon annually entered the bay and river of *Tacirrarmiut* (at *Tuqsug*). The fish arrived in early spring when the temperatures were often cold and some snow remained on the coastline. Sometimes, she said, the river iced up and caused the fish to die prematurely. Fish moving upstream were typically trapped behind rock weirs and speared.

As a young adult Ida regularly traveled overland between the settlements of *Talungmiut* and *Tacirrarmiut*. She recalled an incident when she caught four red salmon and thought to herself, "I wonder if I would get tired if I packed them?" She chopped off their heads, discarded the entrails and took them home like that. "I laid small pieces of wood inside the bottom of my grass (tote) basket, and went home (*Talungmiut*)."

Interviewed in 1989 Walter Amos stated that while his parents lived at *Miqsarmiut* his father would camp in the spring at *Iqugmiut* and pursue crab and seal. Afterwards they moved to *Tuqsug* to fish:

> That's where they hunted in the spring (*Iqugmiut*), but I don't know where it was that they fished. There was hardly any fish down there in those days. But they hunted at *Iqugmiut* during the spring. During the spring when the men went out to go seal hunt, they see king crab under the water. They speared them and, throw them back [?], brought them up and then went off to go seal hunt. That's what (my father) told us. […]There was hardly any fish in that area (*Miqsarmiut* and west), but he said maybe some trout [Dolly Varden]. Over there on the other side at *Tuqsug* he knew they dried some red salmon during the springtime. […] *Canikuryar* (possibly Thomas Chanikalkia, b. ca.1886) stayed there most of the time. He caught red salmon with a fishtrap during the spring and dried them. That is what he used to tell us.

George Williams and Olie Olrun (1990) believed *Tuqsug* was the only place on Nunivak with red salmon. George stated that today they are not often pursued because of the distance *Tuqsug* lies from Mekoryuk and most contemporary fish camps. Some interviewees, however, encountered red salmon in varying numbers in other Nunivak streams. Hilma said while she and Henry had heard of reds in the vicinity of *Tuqsug*, they never specifically targeted them. She said, "Once in a great while we'd get red salmon (from other streams) and once in a great, great while we'd get king salmon." Prudy's husband Dan (personal communication) believed red salmon were spreading; while previously they were only in the stream at *Tacirrarmiut* (*Tuqsug*) in recent years their son caught quite a few around *Paamiut*.

Prudy stated that in the area of their fish camp, *Mecagmiut*, and at the neighboring camp, *Ciqengmiut*, a few red salmon were seen "once in a while." Toward the latter part of June there are red salmon in the vicinity of *Paamiut*, she said. The major stream entering the *Paamiut* estuary is *Paamiut Kuigat*, and the first right bank (west) tributary up from the mouth of the river is named *Cayalegar*, "a place or one with red salmon"(Drozda 1997:44). Prudy never heard of red salmon in the Mekoryuk River, but Howard and Muriel said that once in a while they are caught there; they referred to those fish as *tam'akut* (stragglers).

Prudy observed dead, but not spawned out, red salmon in the *Tacirrarmiut* area; she recalled they appeared very fresh and silver in color. The other interview participants (Howard Amos, Muriel Amos, and Dorothy Kiokun) agreed with Prudy, and had witnessed the same occurrence. Howard said, "we've actually seen red salmon at *Tacirrarmiut*, *Tuqsug*, … dead red salmon, you'd think they might be old, but these are really silver (in appearance)." Prudy emphatically agreed with Howard's statement and Howard and Muriel both stated, "Only in that river." When asked if these salmon were "spawned out," all of the participants replied in unison with a resounding and emphatic, "No!" - adding that they were harvested and eaten.

Dorothy recalled her son Scott had caught a number of red salmon at the same place, where the fish were just entering the river from the ocean. She described the river as very shallow at its mouth, as the fish began to move upstream he caught "I don't know how many" by kicking them toward the shore. Apparently a low tide combined with very shallow lower reaches of the stream (*Cingillret*) left the fish stranded and allowed for easy gathering.

While Howard did not know if they spawned in the stream, he and Prudy believed mid-June would be a good time to find them there, while later on in the summer you do not find them alive. Dorothy stated that her mother told her that red salmon "usually spawn up there, by *Tuqsug*."

Howard said the river at *Tacirrarmiut* that has red salmon has another name, not *Tuqsug*. His father (Walter Amos) had told him the name and that there is an old village site there where red salmon go upstream. Referring to the eastern stream at *Tuqsug* Harry Shavings said, "we call it *Cingillret Kuigat* though (it) is not the name of the river" (Drozda 1997:109).

Andrew Noatak (1986), interviewed at the southwest Nunivak site of *Talungmiut*, provided the only information about the traditional harvest method of red salmon. He said they constructed weirs and fish traps for red salmon in the same manner as with chums:

> They'd make rock piles all the way across the river. Something like a barrier, or a wall of rocks. There was usually an opening, I didn't see a fishtrap (*taluyar)*. I lived over on the other side while they had fishtraps. They should look like a (rock?) barrier across the river.

Andrew's statement about living on the "other side" may indicate that the use of fishtraps in conjunction with stone weirs was discontinued in his lifetime, prior to his residence at *Talungmiut* and or *Tacirrarmiut*. Howard Amos interpreted for Andrew in the BIA ANCSA interview and he told the interviewer in describing the weirs, "I don't know how they look. I've never seen any."

A Stream Named Cayaleg [USGS Jayalik River]

Located approximately twenty miles east of *Tacirrarmiut* (*Tuqsug*) is a small stream of about four miles in length named *Cayaleg*. The name is derived from "*cayag*" the Cup'ig term for "red salmon" and is translated as "place with red salmon" (Drozda1997:92). The same stream was documented by USGS about 1950 as Jayalik Creek; clearly based on an alternate spelling. Andrew Noatak (Noatak and Kolerok1987) described the reason for the name, "because it has red salmon in it, the food that the people of *Tacirrarmiut* have."

Other elders did not confirm the presence of red salmon at *Cayaleg*. Olie Olrun (Olrun and Olrun 1990) stated that *Cayaleg* is just a name for the river. He specifically said red salmon do not enter the river, but he used to spear silver salmon there. Olie admitted to being confused about the exact location of *Cayaleg.* It is also possible that the USGS misplotted the river Jayalik. What Olrun and others of his generation agreed upon is that the only river in that part of the island with a significant run of red salmon is located in the vicinity of Dooksook Lagoon, presumably the stream *Cingillret*.

Others were asked specifically how the stream (*Cayaleg*) obtained its name. Both Ida and Prudy had no information about the stream or its name. George also said he had not heard much about it. While he confirmed red salmon were called *cayag*, he agreed the stream does not contain them and reiterated that red salmon were only found at *Tuqsug*. Howard had not heard of fish at *Cayaleg* either and was skeptical of the prospect that the river supported red salmon.

The stream was surveyed by USFWS (Hout 1966) on July 24, 1965, who determined its entire length was accessible to salmon, yet no species were observed. The survey team postulated that the stream was "probably too shallow" although it held "excellent gravel." Hout (1966:x) remarked that their guide (Kay Hendrickson) claimed "a few salmon enter this stream in August (pinks or silvers), Dolly Varden enter stream in September." There was no mention of red salmon. The stream was also surveyed as part of this project (Appendix H).

Both the place name and Noatak's statement are curious since no other elders would confirm the presence of red salmon in the stream. It's possible the stream supported red salmon at one time, but

has not for many years. Also, the stream was observed by project personnel to have rusty red color; perhaps suggesting the name is metaphorical. Another possibility is that the name is a remnant of an older Cup'ig or Yup'ik dialect and the meaning has shifted over time.

Arctic Grayling, *Culugpaugar*

Nuniwarmiut agree the only stream system on the island that supports Arctic grayling is *Qayigyalegmiut Kuigat* (USGS Kiyakyaliksamiut River). Approximately four river-miles upstream from its mouth the stream forks; the main branch of the southern fork extends nearly 12 miles into the interior, terminating in a lake-studded area at the base of *Qiurtuli* (USGS Kikdooli Butte). This branch is named *Culugpaugaleg*, literally "one with many grayling" (Amos and Amos 2003:95) or "one with Arctic grayling" (Drozda 1997:97). George trapped mink in the area in his younger days and said he caught grayling there on a single hook jig and ate them raw. Grayling was available in all seasons, he said, but were most plentiful in late fall, around October.

Ida also fished for grayling at *Qayigyalegmiut Kuigat*. She said although they were plentiful she personally had trouble catching them. She fished the stream in the fall, after the river had frozen, jigging through the ice primarily for Arctic char and Dolly Varden. She used hand-made lures for jigging and caught many of those fish.

Ida was not familiar with the place name *Culugpaugar*, referring to the tributary instead by the same name as the main stream. She located the fishing area where grayling congregated not at the river fork but at a rocky area downstream; she said, "No one fished where the river forks, but right below that area is where they fish." Helen said one of her boys used to bring home a lot of grayling and twice she had dried them.

Near the mouth of *Qayigyalegmiut Kuigat* is the large old village site of *Qayigyalegmiut*, with former occupation areas on both sides of the river. The village was abandoned by the 1950s when residents moved to Nash Harbor and Mekoryuk. Grayling, Arctic char and Dolly Varden were probably taken much more in the past.

VII. DISCUSSION

Prior to this study, little was documented about the historical or contemporary role of Pacific cod as a subsistence resource among the *Nuniwarmiut*. The natural history of the species in the nearshore waters of the island is virtually unexplored. The absence of Pacific cod for over thirty years from the Nunivak subsistence regimen was largely unnoticed and unreported by outsiders. Only one brief statement regarding the disappearance of Pacific cod "in the mid-1940s" was found in a relatively obscure report (Hout 1966). Key reports and ethnographies (e.g., Lantis 1946; US BIA 1995), while admittedly not subsistence studies, marginalize the role Pacific cod played in the *Nuniwarmiut* economy. At the same time other reports with a focus on subsistence convey an impression that while present at some time, no disruption whatsoever had occurred in the resource (Pete 1984, 1991a, b).

The timing of this project allowed exploration of the topic with the last generation of *Nuniwarmiut* to participate in the fishery at its fullest and who also experienced its crash. Traditional knowledge interviews form the core of this study. These first-hand accounts were based on long-term observation and an intricate awareness of the local environment. Interviewees discussed the occurrence and availability of codfish at multiple locations around the coast of Nunivak Island. They also provided detailed descriptions of the processing, preservation and storage of Pacific cod, including previously undocumented processing methods and sites. Most of this knowledge, had it not been recorded at this time, would almost certainly have been lost forever.

The information gathered from Nunivak residents through taped interviews was considered with other project components - harvest surveys, stream and ocean sampling, and a review of the ethnographic literature. Together they comprise a primary data set providing a depth of local knowledge and understanding which may prove useful across academic disciplines.

The project results confirm the historical, traditional, customary and contemporary importance of Pacific cod in the subsistence regime of the *Nuniwarmiut* and document changes in the resource over the course of the past century. The results appear particularly significant considering the lack of attention given to Pacific cod harvests at Nunivak, past and present, by federal and state resource managers. Secondarily, information was garnered on the little known topics of the distribution of Arctic grayling, red salmon, and other fish species at Nunivak Island and their historical and contemporary use by the *Nuniwarmiut*.

The results of this project are unique in their presentation of *Nuniwarmiut* subsistence fish resources, particularly Pacific cod, in a local context separate from mainland Central Yupiit. While *Nuniwarmiut* are culturally and linguistically related to mainland Yup'ik Eskimos, they remain a distinct group socially and geographically. It is a mistake, particularly with respect to studies of natural resources and in policy-making decisions affecting subsistence, to group the *Nuniwarmiut* - without first considering their unique island environment, its varied habitats, geography and natural resources - with their more abundant neighbors who inhabit the Yukon-Kuskokwim Delta and adjacent coastal areas.

Language Issues and Taxonomy

Although matters of language may seem tangential or irrelevant to a discussion of fishing or subsistence they must be considered here to at least partially explain past errors in interpretation and help avoid such mistakes in the future. Central to any discussion about Nunivak's natural resources - and to better understand the island environment from the cultural perspective of its inhabitants - differences in language, and especially lexicon, between Cup'ig and Yup'ik must be recognized. Knowledge of Cup'ig names for fish and other natural resources and positive identification of species is fundamental to understanding and interpreting the ethnographic record and traditional environmental knowledge of the *Nuniwarmiut*.

Nunivak elders elaborated on activities, materials and methods that no longer exist, in a dialect that has undergone serious degradation within their lifetimes. Over 120 Cup'ig terms associated with the procurement, processing, storage and taxonomy of fish were compiled and 36 fish species harvested or known by the *Nuniwarmiut* were documented, at least half apparently without recognized cognates in other Yup'ik dialects. The most pertinent example is in the finding that prior to this

study there was no clearly recognized or recorded equivalent in Western terminology to *atgiiyar*, the Cup'ig term for Pacific cod (*Gadus macrocephalus*).

Questions remain regarding positive identification of some fish species (for example, *Nuniwarmiut* name at least eight different sculpin) and anatomical terms. These questions could be answered by sampling and keying in collaboration with fisheries biologists. On this project samples of Mekoryuk river "tomcod" were obtained, analyzed and positively identified as *Eleginus gracilis* (saffron cod) by biologists at the University of Alaska, Institute of Marine Science. Specimens were subsequently donated to the UAF lab at their request. Previously, linguistic and ethnographic reference works (identifying the fish as *Microgadus proximus*) conflicted with biological references. *Nuniwarmiut* and Mecklenburg et al. (2002) agree *Microgadus proximus* (Pacific tomcod) does not occur at Nunivak. The confusion stemmed at least in part from the common use among *Yupiit* and *Nuniwarmiut* of the English "tomcod" for two different species of fish, Pacific tomcod and saffron cod.

The study would have benefited from a more complete internal and external taxonomy of fishes to help clarify some terms. The process was complicated by a general lack of familiarity with fish internal anatomy by the principal researcher coupled with the inability of interviewees and interpreters to correlate Cup'ig and English names for some fish parts.

Some Cup'ig terminology may derive from Nunivak subdialects or archaic language requiring more careful linguistic analysis. For example, one interviewee recalled her mother used to speak of catching *uqurlit* ("fatties"). None of the interview participants could identify the fish by its English name. One suggested sheefish but others said they were not sheefish. Another participant said, "They're almost like whitefish," while a counterpart disagreed, saying they are like silver salmon, but very fat. She said they were as big as silvers, but maybe wider on the tail; they were very fat and with very red meat. She recalled that when her mother hung it, it was dripping with fat. Interestingly, *uqurliq* is silver salmon in at least two Central Yup'ik dialects, but at Nunivak silver salmon is *ciayuryar* (cf. YED *caayuryaq*). Contrary to lexical differences with neighboring dialects Cup'ig also exhibits intriguing linguistic similarities with other members of the Eskimo-Aleut language family, as seen in the Nunivak word for Pacific cod "*atgiiyar*" and the Aleut cognate "*atxidax̂*."

Another consideration too complex to explore in this report is the effect, historically, of outside influences (including all Bering Sea Eskimo-Aleut languages) on the Nunivak language directly and its interpretation historically. For example, early ethnographers (e.g., Curtis and Himmelheber) relied largely on translators who's first Eskimo language was not Cup'ig. Similarly, the degree to which contemporary Cup'ig has been influenced by modern Yup'ik has not been studied. Nunivak elder Robert Kolerok told one well respected Yup'ik translator, "Nowadays [1995] people here [Nunivak Island] speak a language that is all mixed up with the mainland speakers" (translated by Meade in Fienup-Riordan 2000:198).

During interviews or when giving statements during meetings where both Cupiit and mainland Yupiit are present (such as regional subsistence meetings) *Nuniwarmiut* (as a minority) may consciously switch to Yup'ik or use terms familiar to Yup'ik speakers in deference to the dominant language/dialect. These points are relevant with respect to discussions of and research about natural resources as well as in studies and policies affecting subsistence resources and issues among the *Nuniwarmiut*.

Reliance solely on Yup'ik speakers for translation or interpretation of Cup'ig should be avoided. On this project one interview was conducted without a Cup'ig interpreter; instead a trained, experienced, fluent lower Yukon Yup'ik speaker was employed. The interpreter's ability to understand the Cup'ig dialect was limited and information regarding fish species was inaccurately interpreted to both the interviewee and interviewer. While Yup'ik and Cup'ig often use the same terms (with minor dialectical differences) to describe the same species of fish, sometimes (as previously stated) completely different words are used and these differences may not be understood or recognized by speakers of different dialects.

Literature

This project revealed that source material cannot be fully trusted with respect to the Nunivak lexicon. For example, in the Yup'ik Eskimo Dictionary (Jacobson 1984) the Nunivak term "*atgiiyaq*" (written according to the General Central Yup'ik dialect) is completely misidentified as "Arctic cod (*Microgadus proximus*)." Interestingly, this particular error was probably perpetuated by a lack of consistency in the use of common English names for resources among the *Nuniwarmiut* coupled with a deficiency of specific biological knowledge by lexicographers.

Similarly, the use of the term "Arctic cod" in the BIA ANCSA Nunivak Overview (US BIA 1995[2]:189) reflects local usage by some and is not necessarily incorrect, but it becomes so if one seeks to identify the species by consulting the Yup'ik Eskimo Dictionary. Misidentification in the BIA work can also be traced to errors in transcription/translation made by those trained in and knowledgeable of General Central Yup'ik, but not fully versed in the Nunivak dialect.

Prior to 1986 (coinciding with BIA ANCSA historical site surveys) very little tape recording of traditional knowledge had been undertaken with *Nuniwarmiut*. Likewise, the Cup'ig language had not seen deep linguistic analysis. Under contract with BIA ANCSA the Alaska Native Language Center (ANLC) produced translations and transcriptions of selected tapes. While ANLC linguists recognized the strong divergence of Nunivak from other Central Yup'ik dialects, and postulated at least one intra-island sub-dialect (Drozda 2007), the transcription work was done almost exclusively by Yup'ik speakers and contains significant errors in translation.

For example, early (and publicly accessible) translations of Nunivak narrative texts misinterpret Cup'ig *iqallug* as "cod," when the accurate translation is generic "fish" (Amos and Amos 2003:140). The Yup'ik Eskimo Dictionary also mistakenly identifies *iqalluaq* as Nunivak dialect "Arctic cod, Microgadus proximus" while (as previously stated) this project revealed it is "saffron cod" (written *iqalluar* in the Cup'ig orthography) and also the Cup'ig generic "fish." These discrepancies might also result from language or dialect shift.

There are a number of problems associated with non-standard English terminology in the literature with respect to fish species at Nunivak. First are the generic references to "cod" or "codfish" which could apply to Pacific cod, Arctic cod, saffron cod, pollock and perhaps some other species. Likewise there is confusion in the literature with the use of generic English terms applied to other fish species, for instance the previously mentioned "tomcod" or Lantis' reference to "red salmon" as "dog salmon" (Lantis 1946:179). In his summary of *Nuniwarmiut* subsistence resources Griffin (2004:141) uses the general term "codfish" followed by his reasonable assumption "(Pacific cod?)".

The parenthetical inclusion and the question mark reveal the uncertain interpretation of his source references (Curtis 1930; Lantis 1946; VanStone 1989) with respect to Pacific cod.

A different sort of error may be traced to the misapplication of traditional knowledge to current or near historic situations. For instance, Fienup-Riordan (1983:114) reported that in the late 1970s Nunivak Islanders crossed Etolin Strait from southern spring camps to Nelson Island where they camped outside the village of Toksook Bay and sold "codfish." Presumably this is Pacific cod, although neither the Yup'ik name, English common name (aside from "codfish"), nor scientific names are given. While it is well documented that *Nuniwarmiut* made trading excursions to the mainland, unfortunately no information was obtained during this project regarding trade of Pacific cod.

While the statement by Fienup-Riordan may have been true historically, in the 1970s context it does not mesh with recent information regarding the total absence of the species in that time frame, as presented by Nunivak elders and fishers. It may also be possible that she (or her source) was speaking of saffron cod. More could be done on this topic by interviewing Nunivakers, and by also obtaining the view from Nelson Islanders, coastal mainland and Kuskokwim peoples.

ADFG reports (Pete 1984, 1991a, 1991b) of Pacific cod fishing at Nunivak between 1950 and 1985 are also at odds with statements of *Nuniwarmiut* elders and fishers presented in this report. The assumption here is ADFG data was compiled after cod returned and projected backward by indicating its presence in the 1960s to the early 1980s.

Prior to Griffin's ethnoarcheological work at Nash Harbor the status of Pacific cod in the traditional *Nuniwarmiut* diet was largely unknown. While excavations revealed substantial quantities of cod remains at Nash Harbor, ethnographic data remained scarce, especially for the island as a whole. This project considered Griffin's ethnographic work (1999, 2004), however, more (perhaps much more) could be gained by review and analysis of his recordings with *Nuniwarmiut* (see Appendix J).

Griffin's work focused on one site and he correctly stated, "The use of specific fishing technologies often related to site selection and seasonal fish availability" (2004:150). Lantis (1946) provided limited numbers relating to subsistence cod from observations she made also at just one location, *Pengurpagmiut* (Cape Etolin). The current study reinforces Griffin's point and found considerable variability in procurement, processing and caching methods at Nunivak, at least partially influenced by microenvironments - more so than the earlier literature would indicate.

In his description of material items relating to fishing technology VanStone (1989:12-13) provided examples of notable differences between *Nuniwarmiut* and mainlanders. His statements are reinforced by those of contemporary *Nuniwarmiut* (for instance with respect to tomcod procurement methods and gear). Regarding Pacific cod it appears the resource played a much greater role in the *Nuniwarmiut* subsistence economy than it did for their nearest mainland neighbors.

Survey

The cod incidental catch survey provided two seasons of baseline data where none had existed before. The surveys revealed Mekoryuk commercial halibut fishers also harvested Pacific cod as "incidental catch" for personal use. When Pacific cod is taken incidentally it is not discarded, but rather is kept and processed as a highly valued food resource.

In-depth comparison of findings with earlier USFWS survey data (non-cod) was not conducted on this project. Such analysis could be beneficial. For instance, one earlier study (Hout 1966) assembled data for the Binajoaksmiut River (*Penacuarmiut Kuigat*) at southern Nunivak. The USFWS team reported both chum and pink salmon in the west fork on July 25, 1965. The current project included a pedestrian survey of the lower reaches of each of the *Penacuarmiut* streams. The east fork survey (USGS Binajoaksmiut River, *Alarneret* in Cup'ig) revealed small fish (fingerlings, approximately 7.5 – 10 cm long) in sheltered spots beneath willows. The stream was very clear and fish were easily seen but not identified. The west fork (unnamed on USGS maps, *Penacuarmiut Kuigat* in Cup'ig) was slightly more turbid than the east and had numerous relatively deep holes (1 – 1.5 m). Although the habitat looked good no fish were observed; unfortunately, net sampling was not conducted during the current project.

The status of the *Penacuarmiut* streams with respect to harvestable fish populations remains uncertain. BIA ANCSA (US BIA1995 [2]:266) documented two sites at *Penacuarmiut* associated with fishing, including reported historical occupations during spring, fall and summer. Today there is no evidence of modern fish camps in the area and our guide stated he had not heard of people camping there, despite easy access to the estuary. Reasons for the avoidance of *Penacuarmiut* as a modern fish procurement site may be socially or family driven, or perhaps has to do with its distance from Mekoryuk (or some other reason). There is only one traditional southern site to the west of *Mecagmiut* remaining as an active modern fish camp, *Talungmiut*. In addition to this example there is a relevant amount of TEK data on other fish species and habitats that was collected but is not included in this report.

Future studies could also benefit by replicating methods of earlier work. For example, in the 1949 USFWS study (Ellson et al.1949) stomach contents of cod taken west of Nunivak were examined. A contemporary analysis of stomach contents of Pacific cod caught near Nunivak compared with the Ellson et al.'s baseline data may also indicate diet and ecosystem changes. Other data presented by Ellson et al. (1949, 1950) on Pacific cod in offshore waters north, west and south of Nunivak are interesting as well.

Red Salmon and Arctic Grayling

This project did not devote much of its resources toward objectives relating to red salmon and grayling. The habitats of these fish and the effort involved in gathering information about them was logistically at odds with the goal of the original investigative plan; still, as recommended, an effort was made to gather some data on these species.

Statements by Hout (1966) regarding grayling are consistent with those of contemporary *Nuniwarmiut* – the fish occur in only one Nunivak watershed. Questions remain regarding the distribution of red salmon at Nunivak and this report, taken with the results of Hout's survey work, provides baseline data for future work that should include a more comprehensive survey of Nunivak

streams. As with grayling, statements by contemporary *Nuniwarmiut* about red salmon conform well to information obtained from residents in the 1960s (Hout 1966). It appears as if two watersheds, *Tuqsug* (comprised of the streams *Tuqsum Kuiga* and *Cingillret Kuigat*) and *Paamiut* (*Paamiut Kuigat* and *Cayalegar*) support substantial populations of red salmon. Other streams support what Hout referred to as "small numbers" and *Nuniwarmiut* called "stragglers." At least two men from Mekoryuk stated they believed the numbers of red salmon were increasing in the *Paamiut* drainages.

While the place name *Cayaleg* (Jayalik River) translates as "red salmon" evidence of the presence of reds in the stream is contradictory. Nunivak guides expressed doubt that the stream carried red salmon in the present or recent past, and suggested the place name may be derived from the rusty red color of the stream's water. Statements by Hout as well as oral accounts from the most reliable Nunivak sources (e.g., Noatak 1986) indicate the stream is named appropriately. Andrew Noatak spent considerably more time in that part of the island than other interviewees or contemporary guides and was deferred to by his peers as the recognized authority on that area (Drozda 1998:x). Today streams with harvestable quantities of red salmon are too distant from Mekoryuk and their runs occur too early to be of economic importance to contemporary *Nuniwarmiut*.

Other Species

Chum salmon remain the primary subsistence fish harvested by *Nuniwarmiut*. In 2006 (this project) approximately 4,100 chum salmon were reportedly taken for subsistence. As a comparison, USFWS (Hout 1966:9) estimated 25,000 chum were taken in 1952 and the harvest averaged between 10,000 and 20,000 fish in the mid-1960s (Figure 10).

According to Howard Amos (personal communication, 2005), twenty years ago (1989) it was not unusual for a family to secure between 500-800 chum salmon within a 2-4 week period. Today that number has decreased to about 100-400 (compare with USFWS [Hout 1966:21] estimate of about 350 chum salmon per family in the mid-1960s).

In January 2009 gasoline sells for $5.49/gallon and two cycle oil for outboard motors $10.09/quart. Fewer families are able to travel to traditional fishing grounds at southern Nunivak because of the high costs. This puts more pressure on Mekoryuk River and streams closer to Mekoryuk.

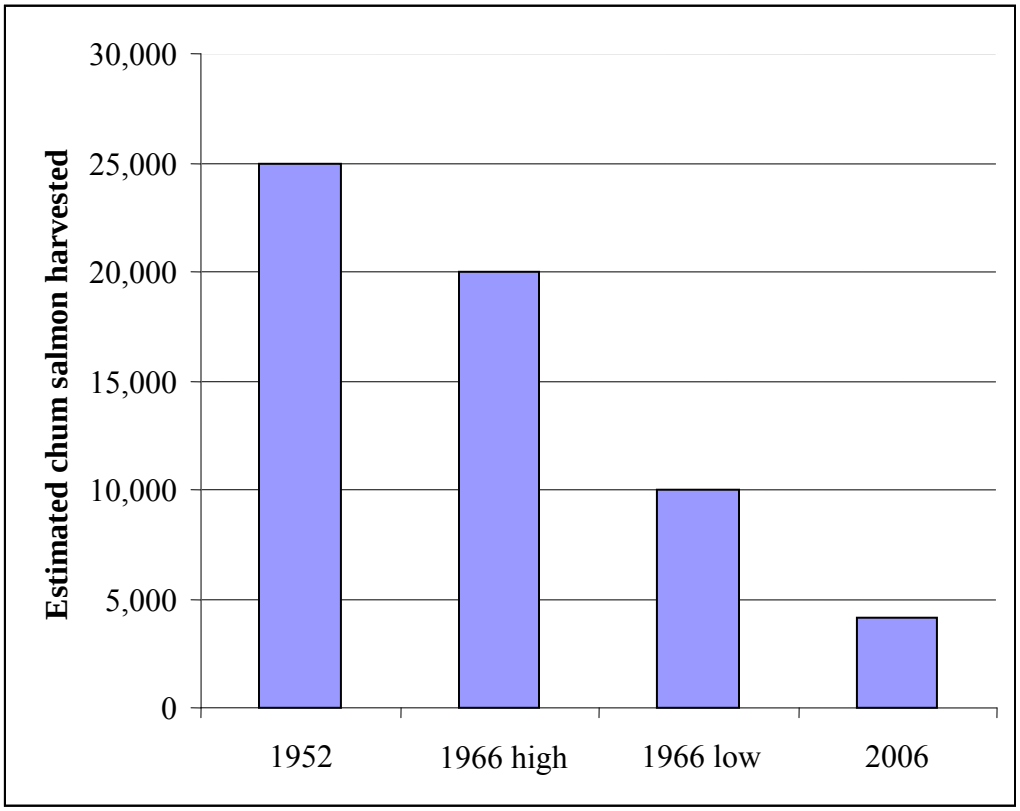

Figure 9: Estimated Chum Salmon Harvests, 1952 – 2006.

Traditional Knowledge

Focused interviews with Nunivak elders revealed extensive information on, and substantially expand our knowledge of, all aspects of traditional cod fishing among the *Nuniwarmiut*. The dynamic between the interview personnel is important to consider. Before collaborating on this project the interviewer (Project Director) and interpreter/translator (Co-Project Director) had a long-standing working relationship. The association facilitated the establishment of trust between interviewees and interviewer resulting in a more relaxed dialog. The interviewer's familiarity with island geography, indigenous place names and the basic structure of the Cup'ig language were each critically important in gathering and processing information before, during and after formal interviews.

Processing Interview Tapes

Processing interviews was by far the most time consuming and challenging aspect of this project; questions remain about the complete accuracy of some of the interpretations of translations and statements contained in interview transcripts. This emphasizes the point that rendering the spoken word to print is a sensitive operation, compounded greatly when it is done from one language to another. More importantly, the Cup'ig language has only recently been written; there are less than five people – anywhere – who have the knowledge of the vocabulary and the understanding of the grammar to translate it accurately.

In this report an effort was made to reorganize orally conveyed knowledge in such a manner as to increase its accessibility to the reader. In some cases original material was compromised or fragmented by removing it from its full contextual foundation. Traditional knowledge is presented here not necessarily as uninterrupted oral history, but also as interpretation. While narratives and/or interpretations were presented as much as possible in ways that maintained context, difficulties associated with translation and presentation of conversational language in print were large and required sometimes less than satisfactory compromise. The author and translator have attempted to make it clear when apparent inconsistencies or contradictions exist, or when certain elements (e.g., dates and quantities) cannot be stated precisely.

The accurate, careful processing of oral data and its interpretation is time consuming and expensive. The pool of qualified individuals available to translate Alaska Native languages is most certainly limited, as I have shown in this report with respect to Cup'ig. Researchers in fisheries and other scientific fields need to understand that recording traditional knowledge is just one step toward increasing knowledge of a variety of subjects. Processing of oral data (with cultural understanding) is every bit as important as recording and requires additional funds and significant amounts of time to accomplish.

Dating and Quantification

It is understood that many Alaska Natives (particularly elders) do not track years and measurements in the same ways as Westerners. To many *Nuniwarmiut*, the Western occupation with obtaining exact dates and with quantification appears almost obsessive. In order to satisfy the needs of the scientific community we must try to get quantitative and temporal information through other, relative means.

Obviously, in historic times the Nunivak people were not measuring and weighing fish. In this study one interviewee described a large cod as attaining the size of a harbor seal, and a small one like a silver salmon. When pressed to provide a size estimate she offered a guess (from head to tail) of two and one-half to three feet long (75 – 90 cm). For comparison, in a 1953 survey (Moiseev 1953) eight-year old Pacific cod from the Bering Sea had a mean length of 73.9 cm; fish over 50 cm have been characterized as "large fish" (Gustafson et al. 2000).

Determining dates is also problematic. The following exchange illustrates two cultural perspectives; the non-native interviewer is trying to determine the year cod reportedly disappeared from the waters around the village of Mekoryuk (italicized narrative in angled brackets is translation):

Interviewer:	Does she remember a time when cod went away, like other people talked about?
Male Interpreter:	*<Do you remember when Pacific Cod disappeared?>*
Interviewee:	*<I do remember, but not sure what year it happened.>*
Female Interpreter:	*<Which of your children was born around that time?>*
Male Interpreter:	*<Or was it during/after you got married?>*
Interviewee:	*<After Amy was born, when my husband and I went to Cape Etolin, her father when he was jigging after Amy's birth, "When was she born, 1974?">*
Male Interpreter:	*<1947?>*
Interviewee:	*<1974?>*
Female Interpreter:	*<Maybe it was in (19)47, is it that person, Amy?>*

Interviewee:	*<Yeah, yes, I forget.>*
Male Interpreter:	*<You probably have it correct, around 1947.>*
Interviewee:	*<Yes, that church down there (was built?).>*
Male Interpreter:	*<Yes, that's it.>* … She's comparing her eldest daughter, who was born in 1947, and the church came here about that time, her dad, her husband went out fishing at that year and caught quite a bit at Cape Etolin. But the year after that its numbers were already shrinking. We're probably looking at 1948 and then after that don't catch any more.
Interviewer:	She was already living in Mekoryuk then?
Male Interpreter:	*<Did you already relocate at that time, did you move here when you married, or why did you move to Mekoryuk?>*
Interviewee:	*<My husband brought me here.>*
Male Interpreter:	So she moved to Mekoryuk after she was married, became married.
Interviewer:	What year was that?
Male Interpreter:	*<When did you get married?>*
Interviewee:	*<I don't know, because I used the ancestor's tradition. I was truly an Eskimo, I don't know exactly when, during the (possibly early) 1900's.>*
Female Observer:	*<Is Amy your eldest daughter, around that time after you got married, you must have bore a child not long after?>*
Interviewee:	*<It was after two years that I gave birth to a child.>*
Female Observer:	*<You must have married around 1945?>*
Male Interpreter:	She probably was married around that year, 1945. They got their eldest child, two, couple years after.

While attempts were made to determine dates based on significant life events - in the above case marriage and the subsequent birth of a child - this too is complicated. Covenant church records at Mekoryuk apparently place all of the marriage dates for the earlier generation of project interviewees at March 17, 1947. "Traditional marriages" may have taken place earlier, but dates were not recorded and those marriages were not recognized as legitimate by missionaries (Amos 2008 personal communication).

Dates for the return of Pacific cod were easier to establish. The interviewer recalled hearing stories of a strong cod run in the year preceding his first summer of fieldwork at Nunivak (1986). Younger (middle-aged) interview participants confirmed the date 1985 by drawing on personal experiences with verifiable dates to record the event. According to one project interpreter (an experienced commercial fisherman), the return coincided with the first year a commercial herring fishery was opened at Nunivak (cf. Pete 1991a, 1991b). The youngest interviewee agreed and also related it to a significant life event; her family's return to Mekoryuk following several years living in Bethel.

Interpreting Geography

Care must also be taken in interpretation of oral statements (e.g., locations of fishing grounds or processing sites) grounded specifically in island geography through repetition of place names. For example, among the *Nuniwarmiut* prominent place names are frequently used to describe not only specific locations but also broader general areas. With this in mind we must evaluate particular and

seemingly contradictory statements. For example, one elder interviewee stated Pacific cod were not abundant at Nash Harbor, but the residents caught large quantities of them at points of land adjacent to the bay of Nash Harbor. Other interviewees spoke in a more general context, were less precise and stated instead that the fish were abundant at Nash Harbor, most likely referring to harvests by *Ellikarrmiut* in a broadly defined "Nash Harbor" geographic area.

We also learned that at Nash Harbor and other locations the varying distances between fishing grounds, processing areas, storage sites and habitations were dictated by the makeup of the local geography. For instance, in the area of the winter village of *Mikuryarmiut* (Mekoryuk) large quantities of cod (and other ocean fish) remained stored through the winter in caches several miles away at the spring procurement site at Cape Etolin. Geographic information such as this, gained through interviews, is critical in interpreting other data sources.

Material and Social Culture

This project added significantly to the knowledge base with respect to fish caching, cache construction, and techniques for processing Pacific cod. Considerable variety in materials and techniques used in construction of fishing related items was presented, indicating idiosyncrasy of the maker and availability of materials as influences on design and construction methods (e.g., cod hook assemblies). The results of this study invite review or reinterpretation of previous ethnographic and archeological data. For instance, artifacts (from Nunivak as well as other Bering Sea locations) formerly identified as net sinkers might now, based on detailed descriptions given by project elders, also be interpreted as anchors for cod (or other) fish hook assemblies. Further, assumptions made by archeologists regarding the antiquity of such items and their manufacture in historic times might be challenged as well (Pratt, personal communication, 2009). The data shows that certain technologies (e.g. stone pecking and the use of bow drills) remained relatively late on Nunivak Island.

The interviews also provide some historical insight into the division of labor among *Nuniwarmiut.* Work did not always divide neatly along gender lines; for example, one female interviewee was taught many skills usually associated with boys or young men. Also, women typically procured fish by shore-based means while their husbands fished from kayaks, or sometimes, as in beach seining, they worked together. Women who were able to provide for themselves attained a special status. One woman who lived at *Qikertarrlugar* (ca. 1920s) and remained unmarried for many years is recalled frequently by elders and her descendants; her hunting and fishing prowess is becoming legendary.

While the disappearance of cod clearly influenced seasonal movements and settlement patterns, the effect of its absence from the subsistence regime and its relation to changes brought about from other influences (e.g., increased adoption of Western technologies and consolidation of Nunivak villages) has not been fully explored.

Modern period

Contemporary *Nuniwarmiut* report the arrival of Pacific cod can be highly unpredictable. The men usually venture out to test fish (as was traditionally done) beginning in May or early June after the ice has cleared from the bays and banks. *Nuniwarmiut* also speculate that schedules may be different on the north and south coasts. In recent years residents report sea ice retreating earlier than

in the past and storms have battered the south coast more, affecting the timing of travel and possibly the movement of or access to Pacific cod in nearshore waters. This project identified substantial erosion affecting access to campsites in the vicinity of *Carwarmiut* at south Nunivak (Figures 4, 5).

One of the younger elders recalled hearing from her elders that as soon as the ice moves on the south side of the island they started fishing for Pacific cod. But she said today they go to their southern fish camps (for chum) later, in late May or June; by then, she suggested, it is too late to catch the peak of the cod run. Her assertion that the ice clears earlier at southern Nunivak suggests social changes such as historical relocation to Mekoryuk and current distances from fish camps may be another factor in their taking less cod today than in the past. Abandonment of the kayak may also explain less exploitation of Pacific cod in very nearshore waters and reefs where modern craft could be damaged in the surf or on rocks.

At least two elders made comments that Pacific cod taken in recent times is somehow different than those of the past, particularly with respect to taste. These sorts of subjective comments are near impossible to verify. While it may be true that the fish tasted better to them in their youth, it might also be a perception exaggerated by the long absence of the fish as well as time and memory in general. One wonders if the diet of the Pacific cod is substantially different than in the past, and if this might also affect the taste. In any case, since there is some baseline data on stomach contents of Pacific cod caught in the vicinity of Nunivak in the 1940s, it would be interesting to record some comparative data today.

VIII. CONCLUSIONS

This project was guided by the informed input and participation of the residents of Mekoryuk. At every level, from the development of the Investigative Plan to the completion of the Final Report select *Nuniwarmiut* were actively involved in project design, methodology and interpretation of data. A substantive portion of the project budget was spent in the village; elders, surveyors, guides, translators and fishers all actively collaborated and were integral to the project. The project budget was completely handled at the village level through the cultural non-profit Nuniwarmiut Piciryarata Tamaryalkuti, Inc. (NPT).

The foremost result of the study was documentation of a prominent and important historical resource, Pacific cod: its abrupt and complete disappearance and 30-year absence from the *Nuniwarmiut* subsistence regime, and its contemporary resurgence in the subsistence economy from the mid-1980s to present.

This project clearly illustrates the extent and depth of the traditional knowledge of *Nuniwarmiut* elders. The primary intent of the project was to focus on one species, known by the *Nuniwarmiut* to have been of critical historical importance but virtually ignored by fisheries and subsistence managers. The project exceeded expectations of the principal investigator regarding the extent of knowledge elders possessed on the topic of Pacific cod harvests at Nunivak Island. The project also demonstrated that local resource persons may possess specific knowledge but will not necessarily speak about it unless directly asked.

The study reinforces the fact that the *Nuniwarmiut*, their resources and island environment, possess considerable differences from their mainland Yup'ik counterparts and the land that supports them. Many of these distinctions are also apparent in the Cup'ig language (aka Nunivak dialect) where resource lexicon can be significantly different from other Central Yup'ik dialects.

Specific Conclusions

- Pacific Cod were traditionally and customarily harvested by the *Nuniwarmiut* prior to 1950.
- Traditionally Pacific cod was a primary food and contributed substantially to the *Nuniwarmiut* diet.
- Pacific cod were available in multiple locations and virtually all coastal areas of the island.
- Pacific cod were harvested primarily in near-shore and estuarial environments.
- Near-shore harvesting of Pacific cod was most often associated with reefs.
- Processing and drying methods for Pacific cod were different than those employed with other fishes (e.g., salmon, herring, halibut).
- The processing (methods and storage) of Pacific cod was directly related to micro-environment.
- Pacific cod numbers declined and the species disappeared from the *Nuniwarmiut* subsistence regime by 1950.
- Pacific cod reappeared in the waters of Nunivak during the mid-1980s and once again became part of the subsistence regime – although less so than in historic times.
- Changes in resources, technology and the effects of outside influences led to a major shift in the Nunivak subsistence economy after about 1950.
- Changes in technology allowed *Nuniwarmiut* to compensate for lack of cod by exploiting salmon and halibut to a greater extent.
- Outside influences and forced relocation to Nash Harbor (subsequently abandoned) and Mekoryuk had a significant effect on the subsistence movements of the *Nuniwarmiut*.
- Pacific cod availability appears less consistent in modern times (1980s to present) than in earlier times (prior to 1950).
- Sockeye salmon occur in several Nunivak streams but are rarely exploited due primarily to run timing and distances from the village of Mekoryuk.
- Spring sockeye salmon runs occur in at least two drainage systems but the extent of sockeye production at Nunivak is still not fully known.
- Chum salmon remain the most important fish resource to contemporary *Nuniwarmiut*.
- Timing of salmon runs plays a critical role in the choice to harvest the resource. Timing relates to other factors such as weather and its effect on drying fish.
- Arctic grayling occur in one drainage system on Nunivak and play a negligible role in the subsistence economy.
- There is considerably more variation in intra-island subsistence patterns among the *Nuniwarmiut* than the literature shows.

- Outside researchers and resource managers must recognize the differences between Nunivak Cup'ig and mainland dialects of Central Yup'ik.
- Mekoryuk residents possess the knowledge and skills necessary to conduct wild resource harvest surveys in cooperation with federal and state agencies.
- Environmental change associated with warming seas and changing weather patterns are impacting Nunivak lands and natural resources.

IX. RECOMMENDATIONS

This project should be viewed as a first step toward understanding the subsistence fish resources, used both historically and contemporarily, by the *Nuniwarmiut*. A significant yet only marginally tapped body of data exists in the form of "oral history" recordings dating from 1975 to the present time. The majority of these recordings originated with ANCSA 14(h)(1) research, as well as individual research conducted by Pratt, Griffin and Drozda. The greater part of the Nunivak recordings are in the Cup'ig language and a high percentage of them have not been fully translated. Some are currently being processed by NPT with support from the BIA ANCSA Office. The number of personnel available to accomplish the task is limited, as only a handful of individuals in Mekoryuk possess the skills necessary for translation and writing the Cup'ig language. These taped records constitute a detailed linguistic data set which deserves the attention of researchers and students of Bering Sea Eskimo-Aleut languages.

The need to translate and transcribe oral records is urgent when we consider that few of the fully monolingual Cup'ig speakers, those with the greatest first-hand traditional knowledge remain. These elders are an irreplaceable resource on both the traditions and language of the *Nuniwarmiut*.

Recommendations in no particular order include:

- Conduct a comprehensive review of existing oral history resources to gather data on geography, natural history and indigenous terminology.
- Budget ample time and money for the thorough processing of oral data.
- Process oral history tapes beyond simple transcription and include carefully prepared translations, summaries, indexes, and the addition of contextual information.
- Conduct comparative studies with other Bering Sea Eskimo-Aleut groups on procurement, processing and storage methods.
- Collect TEK related to Pacific cod fishing at Nelson Island and coastal southwest Alaska.
- Conduct additional research relating to historic Bering sea trawler fishing, climate changes (e.g., Pacific Decadal Oscillation and global warming) and relationship to changes in subsistence stocks at Nunivak.
- Continue Nunivak subsistence surveys under refined methodologies. Surveys can be conducted by paid residents.
- Conduct additional archeological work identifying patterns relating to presence and absence of Pacific cod in different coastal areas of the island.
- Conduct archeological testing or mitigation of sites in clear danger of coastal erosion, especially along south Nunivak coast.
- Conduct traditional knowledge interviews with Nunivakers on topics such as trading of cod fish and species-focused natural histories, for example, herring, blackfish, trout and salmon.

- Identify species and compile an ethnotaxonomy in consultation with fisheries biologists.
- Refine stream and ocean sampling methods in consultation/collaboration with fisheries biologists.
- Analyze the contents of cod stomachs and compare to baseline data.

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Appendix A: Glossary of Nunivak Place Names Mentioned in the Text (Cup'ig orthography and glosses from Amos and Amos 2003 or Drozda 1998).

Interviewee Codes: AN (Andrew Noatak)*, DK (Dorothy Kiokun), DO (Daisy Olrun)*, EK (Edna Kolerok)*, GW (George Williams Sr.), HA (Howard Amos), HeS (Henry Shavings), HiS (Hilma Shavings), IW (Ida Wesley), JD (Joe David), NE (Nancy Edwards), NK (Nan Kiokun), OO (Olie Olrun)*; PO (Prudy Olrun), RK (Robert Kolerok)*, SS (Susie Shavings)
USGS Map location key: NI = Nunivak Island Quadrangle, CM = Cape Mendenhall Quadrangle.
* indicates BIA ANCSA taped interview.

Am'igtulirmiut	*village/residents of the one with many entrances*. USGS Ahmikdoligamiut (misplotted). NI(A-2); Map 2. EK
Aqitumiut / Aqitur	*village/residents of eat one's fill of food*. USGS Ahkitook. NI(B-4); Maps 1, 3. HiS, HeS, SS
Asweryagmiut	*village/residents of the place of many beached walrus*. CM(D-5); Map 3. PO Note: Place name derived from Yup'ik 'Asveq, walrus;' walrus in Cup'ig is 'kaugpag.'
Ataatagguar	*imitation paternal uncle.* NI(B-4). Map 3. Small islet west of Mekoryuk. HA
Atengmiut	*village/residents of Ateng* (analysis unknown). USGS Ahdingmiut. NI(B-5); Map 3. PO, NK, OO
Cape Corwin	see *Cing'ig*. CM(D-2); Map 2.
Cape Etolin	see *Pengurpagmiut*. NI(B-4); Map 1. HeS; PO, JD, SS, IW, NE
Cape Mendenhall	see *Cingigglag*. CM(D-3)(D-4); Map 2.
Cape Mohican	*Iq'ug*. NI(A-7); Map 3. JD
Caputnguat	*fence-like places; false weirs*. Rocky spits at *Paamiut Taciat*. CM(D-2); Map 2.
Carevner	*result of a powerful ocean current*. At USGS Ingri Butte. NI(A-6); Map 3. IW
Carwarmiut	*village/residents of the result of a strong current, or stream with a strong current*. USGS Chakwakamiut. CM(D-5); Map 3. HeS
Cayaleg	*a place with red salmon (cayag)*. USGS Jayalik River CM(D-5); Map 3. GW, HiS, PO, IW
Cayalegar	*resembling one with red salmon (Cayag)*. Tributary of *Paamiut Kuigat*. CM(D-3); Map 2. PO
Ciguralegmiut	*village/residents of place of pigeon guillemots*. USGS Chigoorhaligamiut. CM(D-3); Map 2. NK, SS, IW, EK Notes: 1. Lantis (1946:162) identified *Ciguralegmiut* as a "spring and summer village for *Itegmiut*, for seal hunting and cod fishing,"

2. Previous translation of *Ciguralegmiut* (in Drozda 1998:74; US BIA 1995[2]:198) "village/residents of place with murrelets" is an error, probably based on a Yup'ik translation (cf. Jacobson 1984:116). *Cigurer* in Cup'ig is "pigeon guillemot (*Cepphus columba*)." E.W. Nelson recorded the word for "guillemot" (*Uria grille*, name changed later to *Cepphus* sp.) as chig-u-vik (diacritical marks removed here), listed in Jacobson as "unidentified" (1984:638). It is unclear where in the Yup'ik area Nelson collected the name. Pigeon guillemots are very common on the southern shores and islets of Nunivak, while murrelets are rare.

Cing'ig — *protruding land point*. Cape Corwin, at USGS Ahtago Point. CM(D-2); Map 2.
NK, JD
Note: Nuniwarmiut frequently use the Cup'ig toponym *Cing'ig* and the English name "Cape Corwin" synonymously. This may cause confusion since USGS maps place "Cape Corwin" about 3 miles south of *Cing'ig*. *Cing'ig* ("point"), and the historical site *Cingigmiut* are located on a peninsula or cape labeled "Ahtago Point" on USGS maps. Nunivakers are unable to provide a Cup'ig equivalent for "Ahtago" Point and they have a broader or more inclusive concept of the land area designated Cape Corwin where USGS designation is more restrictive (see Map 2)

Cingigarmiut — *village/residents of protruding sharp point of land.* At USGS Chingeeruk Pt. NI(B-5); Map 3.
IW, NE, OO

Cingigglag — *a major point of land*. USGS Cape Mendenhall. CM(D-3)(D-4); Map 2.
PO, NK, EK, JD, IW, RK
Note: Lantis (1946:162) reported "good codfishing… at the cape," but also suggests in 1940 the Cape Mendenhall area was "possibly…fished out," referring perhaps to salmon.

Cingigmiut — *village/residents of the old protruding land point*, at USGS Ahtago Pt. CM(D-2); Map 2.
NK, JD
Note: BIA ANCSA recorded *Cingigmiut* as a spring camp for *Ingrimiut* (1995[2]:6), a summer camp "probably for cod fishing" (1995[2]:43) and estimated it was likely abandoned as a seasonal camp about 1950 (1995[2]:44).

Cingillret — *feet/ankles* (?)
PO

Cingillret Kuigat — *the river of feet*. Stream at *Tacirrarmiut*/*Tuqsug*; NI(A-6); Map 3.
PO
Notes: Previous translation (in Drozda 1998:108) as "the river of the old points" is an error; an earlier name may have been forgotten, cf. Shavings 1986.

Ciq'amqur / Ciq'aumqur — pond at *Pengurpagmiut*, personal name. NI(B-4); Map 1.
SS

Ciqengmiut — *village/residents of splashing, acquired splashing*. USGS Chikungamiut; CM(D-4); Map 2.
PO
Note: name derived from the splashing made by large quantities of fish moving into shallow waters (Drozda 1998:93).

Culugpaugaleg — *one with many grayling*. Tributary of *Qayigyalegmiut Kuigat*; NI(A-6); Map 3.
IW

Cuqucuryarmiut — *village/residents of Cuqucuryar* (analysis unknown). Variant, *Paamiut*; CM(D-2); Map 2.
Note: Older name for *Paamiut* (Drozda 1998:43-44; US BIA 1995[2]:30).

Duchikmiut River — see *Tacirmiut Kuigat*

Duchikthluk Bay	see *Tacirrlag*
Ekrag	*to get into first*. Water gap at Cape Etolin; NI(B-4); Map 1. SS Note: A fine photograph taken by Henry Collins illustrating *Ekrag* at low tide is included in Fitzhugh and Kaplan (1982:2-3).
Ellikarrmiut	*village/residents of the whetstone*. USGS Nash Harbor. NI(A-6); Map 3. DK, NK, GW**,** HiS, IW, NE, JD, EK, NE, OO Nunivakers also refer to *Ellikarrmiut* as Nash Harbor. In the past *Ellikarrmiut* was the name applied to the east side while the west was named *Qimugglugpagmiut*, today both areas may be referred to as *Ellikarrmiut* or Nash Harbor.
Englullrarmiut	*village/residents of area without much coarse grass.* NI(B-2); Map 1. HeS, JD Nunivakers refer to this as Cape Manning in English, although USGS places Cape Manning to the south of *Englullrarmiut*.
Englullugmiut	*village/residents of area with a healthy growth of coarse grass.* site on the east coast of Cape Mendenhall. CM(D-3); Map 2. EK, RK Notes: BIA ANCSA (1995[2]:189) references to "Arctic cod" fishing in the spring here probably refer to Pacific cod, also referred to as "Arctic cod" by *Nuniwarmiut*.
Englulluguaremiut	*village/residents of the tall course grass*. CM(D-3); Map 3. NK
Illragglit	(*Usragglit*?, possibly an error in transcription) NE
Ingrig	*two mountains*; USGS Twin Mountain; NI(A-2); Map 2.
Ingrimiut	*village/residents of the mountain*. USGS Ingrimiut. NI(A-2); Map 2. JD
Iqallul'eg / Iqalluleg	*one with fish*; *a place with fish*; Cinder cone, 240 meters (789 ft.) above sea level. CM(D-3); Map 2. PO
Iqallulgem Nanwii	*lake of a place with fish*; Headwater lake of *Kuigglugar*. CM(D-3); Map 2. PO
Iqangmiut	*village/residents of dirt or grime*; *dirty village* (cf. Yup'ik, Iqa-?). CM(D-4); Map 2. NK, SS, IW, EK
Iqiucirwig	*place for poles used for stretching net ropes*; also *Iqiucirwigmiut*. NI(B-4); Map 4. GW, SS
Itegmiut	*village/residents of lower part of foot*. USGS Etikamiut. CM(D-3); Map 2. IW
Karirrlugar ?	(possibly *Kangir'irrrlag*?) HiS
Kialiraluar	*place really inside*, also *Kialiraluarmiut*; at Cape Etolin. NI(B-4); Map 1. SS
Kiiwigmiut	*village/residents of a place to peel layers off objects*. at USGS Bimiut. CM(D-3); Map 2. NK, IW Note: *kii-* to peel off, as in old paint, or sod from the tundra; fish camp of *Paamiut*.

Kuigglugarmiut	*village/residents of the poor old river*. CM(D-3); Map 2. NK, IW Note: fish camp of *Nunarrlugarmiut*
Kuigglugar / Kuiglugg'ar	*old river*; *poor old river*. CM(D-3); Map 2. PO
Mecagmiut	village/residents of the wet swampy area; in vicinity of USGS Mechakamiut. CM(D-4); Map 2. PO, NK, JD, IW Note: also used generally to refer to the area, including several camps, around *Mecagmiut Taciat*.
Mecagmiut Kuigat	River of *Mecagmiut*. CM(D-4); Map 2. PO
Mecagmiut Taciat	Estuary of *Mecagmiut*. CM(D-4); Map 2. JD
Mekoryuk	see *Mikuryarmiut*
Mekoryuk Bay	see *Mikuryarmiut Taciat*, USGS Shoal Bay.
Mekoryuk River	see *Mikuryarmiut Kuigat*.
Mikuryarmiut	*village/residents of abundance* (cf.Yup'ik, *Mikur*-). Mekoryuk. NI(B-4). Map 1. GW, HiS, HeS, PO, NK, SS, JD, IW, NE, EK
Mikuryarmiut Kuigat	*River of Mikuryarmiut*. USGS Mekoryuk River. NI(B-4). Map 1. PO, JD, SS
Mikuryarmiut Taciat	*Estuary of Mikuryarmiut*. USGS Shoal Bay. NI(B-4). Map 1. SS
Miqsarmiut	*village/residents of hard, bluish stone used for making wood shaping tools*. USGS Mikisakmiut. NI (A-7); Map 3. NK, GW, NK Notes: Nan's older brother, Jack U. Williams Sr. (1911-1994) recalled living at *Miqsarmiut* throughout the winter months for several years in the 1920s. Peter Smith (1912-1995) also identified it as a year round village and stated that fish were not abundant in the site area (US BIA 1995[3]:61-62).
Nanwarrlim Cing'ia	*the point of a major lake*; NI(B-4). Map 1. HA
Naparyaleg	*one with a post.* USGS Nabaksyalik Pt.. NI(B-4). Map 1. HA
Naruyatulirmiut	*village/residents of a place with abundant gulls or close friends*. USGS Nakooytoolekmiut. CM(D-2); Map 2. NK
Nash Harbor	village. see *Ellikarrmiut*; Notes: 1. Nash Harbor refers to the village sites of *Qimugglugpagmiut*, *Ellikarrmiut* and general vicinity. See also Griffin 2004. 2. Lantis (Lantis 1946:163) referred to "codfish banks offshore" at Nash Harbor.
Negermiut	*village/residents of the west*. USGS Nariksmiut. NI(B-5); Map 3. IW, OO Note: previously translated as village/residents of the northwest (Drozda 1998:137; US BIA 1995[3]:145). Cardinal directions may have been discerned differently in the past. Lantis (1946:171) noted "confusion of the terms for 'south' and 'west'."
Nunarrlugarmiut	*village/residents of the good old land*. USGS Nunathloogagamiut. CM(D-3); Map 2. PO, NK, SS, IW

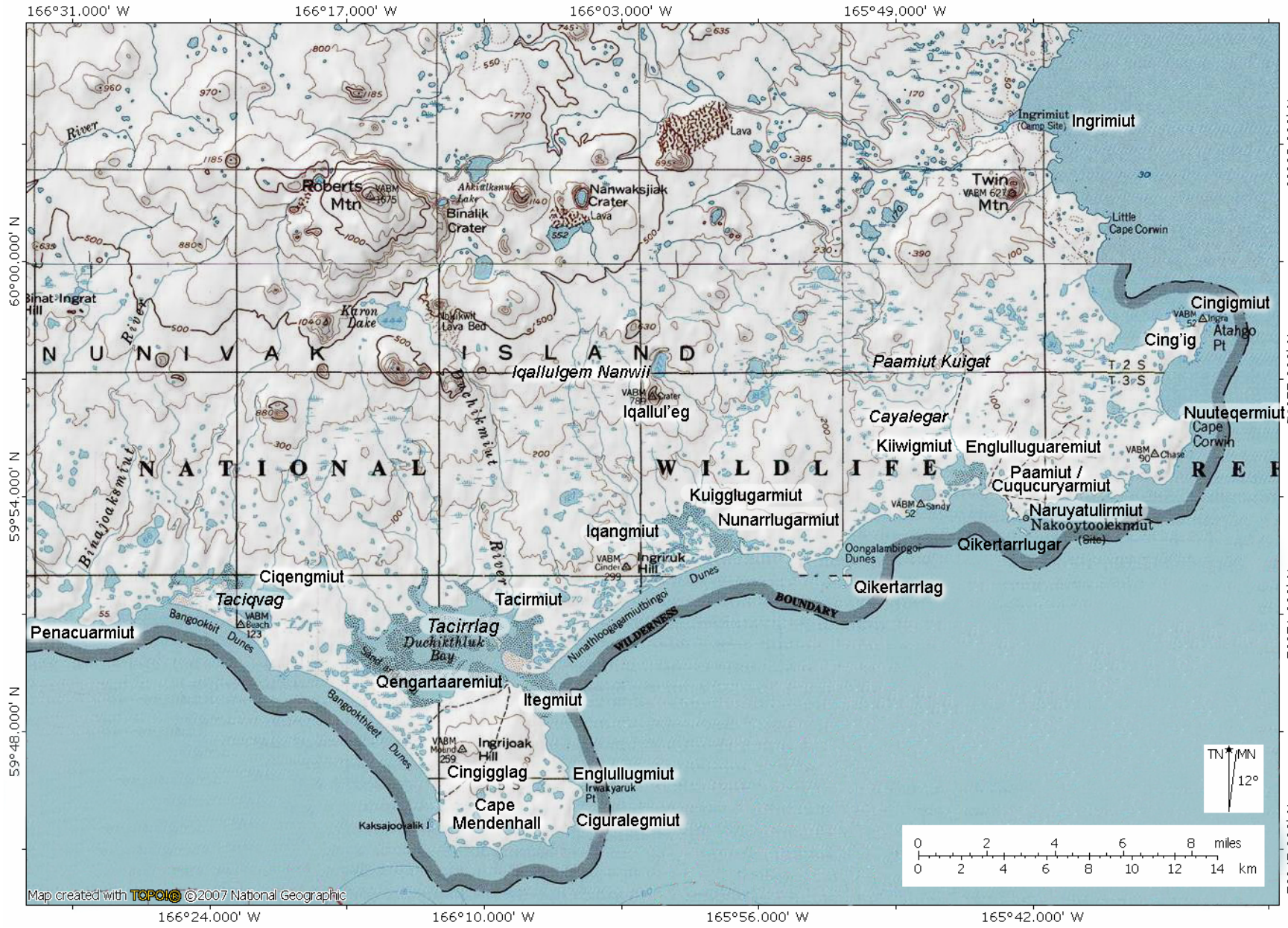
Nunarrlugarmiut Taciat	*Estuary of Nunarrlugarmiut*. Map 2. PO, NK
Nuniwar	*Nunivak Island.* Figure 3. *Nuniwarmiut* – the indigenous residents of Nunivak Island; Cup'ig Eskimos (*Cupiit*).
Nuugavlarmiut	*village/residents of good little point of land* (from *nuwug*, point of land). NI(A-2); Map 1. HiS, NK
Nuuteqermiut	village/residents of (place) suddenly reaching out together. At Cape Corwin. see also *Wiwukaaremiut*. CM(D-2); Map 2. NK, HiS Notes: 1. Name refers to two rocky reefs on either side of the village jutting out into ocean, *Nuwugyarrluggat*. 2. Nan described *Nuuteqermiut* as "*Aagallngum nunai*" literally "*Aagallngur*'s land" and "*Aagallngur*'s village." While Nan could not provide an English name for *Aagallngur* he is probably Isaac Arraidlngok (b. ca. 1894) as recorded in the 1940 U.S.Census. (05NPT002). Nan and her older brother Jack were raised by Isaac. BIA ANCSA indicated the family seasonally occupied the site from 1921 or earlier, to 1926. Her husband Edward Kiokun also identified the site as a spring and summer cod fishing location (1994:[2]54). Nan stated because of the abundance of Pacific cod Kay Hendrickson (1909-2001) also used to fish there.
Nuwugyarrluggat	*bad (long, jagged) rocky points*. CM(D-2); Map 2. Note: Two points, situated immediately north and south of *Nuuteqermiut*.
Paamiut	*village/residents of the river mouth*. Variant, *Cuqucuryarmiut*; CM(D-2); Map 2. HiS, PO, NK, IW Note: *Paamiut* also used generally to refer to the area, including several camps around *Paamiut Taciat*.
Paamiut Kuigat	*River of Paamiut*. CM(D-2, D-3); Map 2. PO, NK
Paamiut Taciat	*Estuary of Paamiut*. CM(D-2, D-3); Map 2. PO
Penacuarmiut	*village/residents of the small cliffs*. USGS Binjoaksmiut. CM(D-5); Map 2. PO
Penacuat	*small cliffs/bluffs*. CM(D-5); Map 2. JD
Pengurpagmiut	*village/residents of the dunes*. at USGS Cape Etolin. NI(B-4); Map1. HeS, PO, NK, JD, SS, IW, NE
Pim'ayug/Pimaayug	*place to do something.* NI(A-5); Map 3. NE
Qaneryagtalegmiut	*village/residents of the place with many mouths* or *many things to say*. Talking Village. USGS Kanikyakstalikmiut (misplotted). NI(A-2); Map 3. HiS
Qavlumiut.	*village/residents of the eyebrow*. USGS Kuvlomiut. NI(B-3); Map 1. HiS
Qayigyalegmiut	*village/residents of place with spotted seals*. Vicinity of USGS Kiyakyaliksamiut. CM(D-6); Map 3. PO, IW Note: Name is derived from the Norton Sound Unaliq word for spotted seals.

Qayigyalegmiut Kuigat	*river of Qayigyalegmiut*. USGS Kiyakyaliksamiut River. NI(A-6); Map 3. GW, PO, IW
Qengartaarag / Qengartaaremiut	*village/residents of the nose-like object*. USGS Kingaktakamiut. CM(D-4); Map 2 PO, GW, JD, IW
Qerrirlit	*shiny ones, polished ones*. USGS Cape Algonquin. NI(A-6); Map 3.
Qerrumal^{z}ria	Translation uncertain may have something to do with dying from hypothermia. Cliff area north of Nash Harbor. NI(A-6); Map 3. NE
Qikertarrlag	*major island*. NI(D-3); Map 3. Note: Among *Nuniwarmiut* this is the former habitation site of a well remembered historical figure, *Arnaracungar*, who was considered remarkable because she subsisted without the aid of a husband. BIA ANCSA (1995[2]:80-83) report multiple oral history references to cod fishing activities by *Arnarcungar* and others at *Qikertarrlag*. References in the BIA work to murrelet are probably mistaken and should be pigeon guillemot instead, a mistake that resulted from early transcription of oral history tapes by Central Yup'ik speakers rather than Cup'ig speakers. see *Ciguralegmiut.*
Qikertarmiut / Qikertaaremiut	*village/residents of the small island*. Upstream from Mekoryuk. NI(B-4); Map 1. JD
Qikertarrlugar	*an old island*. South of *Naruyatulirmiut*. CM(D-2); Map 2. NK
Qikumiut	*village/residents of the clay (area)*. USGS Kigoumiut. NI(A-6); Map 3. NK, NE
Qikunguarat	*imitation or fake clay.* NI(B-4). Map 1. HA
Qiut	*lichen-covered land rocks*. Seining site in the vicinity of *Paamiut*. CM(D-2); Map 2.
Taciqvag	*big estuary*; CM(D-4); Map 2. PO, JD, SS
Taciraugar	*a small estuary.* USGS Dachirowruk Cove. NI(A-5); Map 3. NE Note: previous spelling: *Tacirraugar* (Drozda 1998:129); associated site, *Tacirraugarmiut*.
Tacirmiut	*village/residents of the estuary/bay*. USGS Duchikmiut. CM(D-4); Map 2. SS, OO
Tacirmiut Kuigat	*river of Tacirmiut*. USGS Duchikmiut River. CM(D-4); Map 2. SS
Tacirrarmiut	*village/residents of the small estuary*. NI(A-6); Map 3. PO, IW, AN
Tacirrlag	*Major Estuary or Bay*. USGS Duchikthluk Bay CM(D-4); Map 2. PO, SS, EK, OO
Talking Village	see *Qaneryagtalegmiut* HiS
Talungmiut	*village/residents of the partition (natural projection that blocks the view of the village from the sea)*. USGS Dahloongamiut. CM(D-6) Map 3. GW, PO, NK, JD, IW, NE

Taprarmiut	*village/residents of a spit of land*. USGS Daprakmiut. NI(B-3); Map 1. HiS, HeS, EK
Tevner	*reefs that are covered by seawater at high tide*. At Cape Etolin. NI((B-4); Map 1. SS
Tunram Qanra	*the devil's mouth*. An opening or cave in the cliff along the southwest coast. NI(A-6); Map 3. AN Note: Today the Nunivak word "Tunrar" is translated as "evil spirit, devil or Satan" (Amos and Amos 2003:329), this interpretation reflects the strong Christian influence and beliefs among the Nuniwarmiut. In the past the word had different spiritual meaning, referring to a shaman's helping spirit (c.f., Fortescue et al. 1994:346; Jacobson 1984:380).
Tuqsug	*lagoon*. USGS Dooksook Lagoon. NI(A-6); Map 3. GW, HeS, PO Note: Also used to refer collectively to the area of *Tacirrarmiut*.
Tuqsum Kuiga	*River of Tuqsug*. USGS Dooksook River. NI(A-6, A-7); Map 3. PO
Uglir	*where walruses and seals beach*. at Cape Etolin. NI(B-4); Map 1. SS
Urwignar	*place to become discolored*. USGS Arwirnuk Rock. NI(B-4); Map 1. HiS; HeS
Usragglit	translation uncertain, "howling ones?" cliff area north of Nash Harbor village. NI(A-6); Map 3. NE
Wiwukaaremiut	*village/residents of part of a backbone complex*. Northernmost part of *Nuuteqermiut*. CM(D-2); Map 2. NK

Appendix B: Place Name Maps

Map 1. Northeast Nunivak, *Aqitug* to *Am'igtulirmiut*.



Map 2. Southeast Nunivak, *Ingrimiut* to *Penacuarmiut*.

Map 3. Western Nunivak, *Penacuarmiut* to *Aqitur*.

Appendix C: Oral History / TEK Interviews

Tape Numbers NPT / UAF	Date	Interviewee(s)	Interviewer	Interpreter(s)	Place	Time hr:mn
05NPT001; H2006-03-01	06/14/05	Prudy Olrun (~63)	Robert Drozda	Howard Amos	Mekoryuk	00:47
05NPT002; H2006-03-02 (part 1)	06/15/05	Nan Kiokun	Robert Drozda	Howard Amos	Mekoryuk	01:30
~~05NPT003;~~ **Destroyed**	~~06/15/05~~	~~Nan Kiokun~~	~~Robert Drozda~~	~~Howard Amos~~	~~Mekoryuk~~	~~00:00~~
05NPT004; H2006-03-02 (part 2)	06/15/05	Nan Kiokun	Robert Drozda	Howard Amos	Mekoryuk	
05NPT005; H2006-03-03	06/18/05	George Williams; Helen Williams	Robert Drozda	Monica Shelden	Bethel	01:30
05NPT006; H2006-03-04	10/21/05	Hilma Shavings; Henry Shavings	Robert Drozda	----------	Anchorage	00:54
05NPT007; H2006-03-05 (part 1)	12/07/05	Susie Shavings	Robert Drozda	Howard Amos	Mekoryuk	01:30
05NPT008; H2006-03-05 (part 2)	12/07/05	Susie Shavings	Robert Drozda	Howard Amos	Mekoryuk	00:20
05NPT009; H2006-03-06	12/07/05	Joseph David Sr.	Robert Drozda	----------	Mekoryuk	01:00
05NPT010; H2006-03-07 (part 1)	12/08/05	Ida Wesley	Robert Drozda	Howard Amos	Mekoryuk	01:00
05NPT011; H2006-03-07 (part 2)	12/08/05	Ida Wesley	Robert Drozda	Howard Amos	Mekoryuk	00:10
05NPT012; H2006-03-08	12/08/05	Nancy Edwards	Robert Drozda	Howard Amos	Mekoryuk	00:55

Appendix D: Examples of Research Questions (Pacific cod specific)

What is your first memory of cod fishing?
Where did you go and fish for cod?
What time of year?
How important were cod?
What was the size of the catch?
What methods were used for catching?
What methods were used for processing?
How were fish stored?
How did methods differ from other species?
Was there relationship to other species (e.g. herring spawning)?
What terminology is specific to cod and cod fishing?
Was cod ever valued as a trade item?
What parts were used/discarded?
Were there non-food uses of cod?
Medicinal value of cod?
How did women participate in the fishery?
What was/is your favorite part of the cod for eating?
Environmental conditions favorable for cod fishing and processing?
Were there any signs or signals to indicate the presence of cod?
Was weather and or sea ice a factor in cod fishing?
How did men know when to prepare?
Did Pacific cod enter rivers?
When did cod fishing begin? Finish?
Did you hear of strong cod runs in one area when weak in others?
Were particular areas known to be better for cod fishing?
Was the cod fish harvest consistent from year to year?
Do you notice any difference in the cod that you see today, compared to those of your youth?
Do you know of any traditional stories (tales) associated with *Atgiiyar*?
Do you remember a time when the cod were not present?
When was the last time you remember a strong cod run?

Appendix E: Release Form Example

Oral History Gift and Release Agreement

Thank you for your generous contribution of knowledge to the Oral History Archives. We welcome the opportunity to have the (audio or video) recording made with you on 12/8/05. The Oral History Archives agrees to preserve your recording and make it available to the public.

In consideration of the role of the Archives in preserving and making your recording available, we ask you to agree to the following:

I, Nancy Edwards, transfer to the University of Alaska Fairbanks' Rasmuson Library my title, interest, and copyright to the recording.

I also agree not to hold the University of Alaska Fairbanks liable for how it makes the recordings available and how it preserves them. I further acknowledge that I have been informed of the following:

- The Oral History Program makes recordings available to researchers, writers, scholars, students, and the interested public.
- The Library may make this recording electronically accessible via local area networks, the Internet, or other electronic means for access and preservation purposes.
- While the Library only intends to make the recordings available for educational and/or non-commercial purposes, by signing this form I release the Library and the University from liability in cases where individuals who access a recording might violate these conditions.

Please be assured that we will do all that we can to inform users of these conditions and thereby minimize the potential for misuse. **None of the above mentioned conditions restricts you from re-telling and/or recording again any of the information you gave on this recording.**

Nancy Edwards
(Narrator's printed name)

Dec. 8, 2005
(Date)

P.O. Box 94 Mekoryuk, AK 99630
(Narrator's printed mailing address)

Nancy N Edwards
(Narrator's signature)

Robert M. Drozda
(Interviewer's printed name & signature)

Dec 8, 2005
(Date)

(Collection manager's signature)

Form revised on 1/24/02

Appendix F: 2006 Subsistence fish survey results. All fishing households were surveyed.

HH / #in HH	Camp (Salmon)	Fishing Sites	Dates or time fished[1]	Fish species / No. (est.)[2]	Fish Method	Observations, comments of fishers as recorded by surveyor.	Goal met?
1 / 4	Mekoryuk River	Mekoryuk River	June – 2 weeks	Chum 117 Red 1 Pink 5 Flounder 6	Net	Snow melted late, chum are a little bit late. More fish than last year. Surveyed Aug 1.	yes
		Bering Sea	-	P-cod 4	jig		
		Nelson Island	-	Red Salmon 16	Net		
		Bering Sea	-	Halibut 10	Jig		
		Below airport	-	Herring 100	Net		
		Mekoryuk River	-	Tomcod 50	Jig – ice		
2 / 5	Iwerwigmiut	Mecagmiut Taciat (bay)	June 25 – July 4	Chum 30	Net	Weather has been cold, windy, mid-July started raining. Fishing was good, excellent. More fish, weather about the same from last year. Had to throw couple fish because the meat was discolored. Surveyed July 31.	yes
		Mecagmiut Kuigat (river)		Chum 345	Net		
		Iwerwigmiut area		P-cod 3	Jig		
		Iwerwigmiut area		Halibut 2	Jig		
		Nelson Island	-	Herring 100+	net		
3 / 3	Qengartaaremiut	Tacirmiut Kuigat	June 30 – July 2	Chum 85	Net	You need to re-do your questions and not repeat. Surveyed July 31.	yes
		Qengartaaremiut		P-cod (nr)	Rod		
		Bering Sea		Halibut (nr)	Rod		
		Nelson Island	-	Herring (nr)	Net		
		Mekoryuk River	-	Tomcod (nr)	Rod		
4 / 3	Talungmiut	Talungmiut	July 1st week	(nr)	-	Cold, unusual – cold. Surveyed July 31.	yes
		Mekoryuk River	-	Chum 180	net		
			-	Pink 40			
			-	'little salmon' 1			
		Bering Sea	-	Halibut 20	jig		
5 / 8*	Emnerermiut	Kuigaaremiut	July 1st week	Chum 200	Net	* included family outside Nunivak. Lots of fish. Surveyed August 1.	yes
		Bering Sea	-	Halibut 4	jig		
		Mekoryuk River	-	Herring 100	net		
6 / 6	Nunarrlugarmiut	Kuigglugar, Nunarrlugarmiut	July 3, 2 hours	Chum 200	Net	Too cold. Surveyed August 1.	yes
		Bering Sea	-	P-cod 25	jig		
			-	Halibut 12	jig		
		Mekoryuk River	-	Tomcod 200	jig		
7 / 6	Emnerermiut	Kuigaaremiut	July 4, 6	Chum 200	net	More chum salmon than last year. Weather was same as last year. Surveyed July 31	yes
		Cape Etolin	-	Halibut 7	jig		
		Nelson Island	-	Herring 120	net		
		Mekoryuk River	-	Tomcod 150	jig		
8 / 3	Nunarrlugarmiut	Nunarrlugarmiut	July 5	Chum 212	net	Weather is good drying weather, lots of fish, fished only 2 days, not like before. Drinking	yes
		Mekoryuk River		Pink 49	net		

[1] Dates typically refer to salmon fishing only, however, many fishers also pursue halibut and cod while drying salmon at camp.

[2] Survey targeted grayling, halibut, herring, Pacific cod, tomcod (saffron cod) and salmon species, when not sought these fish are not listed in table. Where sought but not captured a zero (0) is recorded, and "nr" indicates "no record."

		Bering Sea		Halibut 10	jig	water dried up. Never had sunshine like before(?).Surveyed July 31	
		Nelson Island		Herring 80	net		
9 / 2	Nunarrlugarmiut	Iqangmiut	July 5 – 8	Chum 240	net	Typical year. Surveyed July 31.	yes
		Bering Sea		Halibut 7	jig		
10 / 4	Negermiut	Negermiut	July 5-18	Chum 153 Pink 10	net	Fish is late, climate is colder. Surveyed July 31.	yes
		Mekoryuk	-	Halibut	jig		
			-	Tomcod 100	jig		
11 / 1	Mekoryuk River	Mekoryuk River	July 6 – 8	Chum 30	net	More fish, tomcods. Surveyed August1.	no
		Kotzebue	-	Tomcod 75	jig		
12 /2	Nunarrlugarmiut	Nunarrlugarmiut	July 6, 7, 8	Chum 240 Pink 2	net	Too cold, more fish at camp. Weather was hot. Surveyed August1.	no
		Bering Sea	-	P-cod 11 Halibut 4	longline / jig		
		Below airport	-	Herring 60	net		
13 / 2	Paamiut	Paamiut River and Kuigglugar	July 7, 2 hours	Chum 115	net	It was good fishing. Good drying season, sunshine, warm, lots of fish. Surveyed July 31	yes
		Bering Sea	-	P-cod 20 Halibut 4	Jig		
		By airport	-	Herring 100	Net, hand		
		Mekoryuk River	-	Tomcod 200	Ice-jig		
14 / 4	Negermiut	Negermiut Kuigat	July 7 – 9	Chum 100 Pink 5	net	Have to go out on nice days. Colder, about the same as last year. Surveyed August1.	yes
		Bering Sea	-	Halibut 15	jig		
			-	Herring 100	net		
		Mekoryuk River	-	Tomcod 100	jig		
15 / 3	Nunarrlugarmiut	Kuigglugar	July 7, 9	Chum 50	set net	More fish at fish camp.	yes
		Mekoryuk River	-	Pink 45	gill net		
		Nelson Island	-	King 3	drift net		
		Qayigyalegmiut	-	Grayling 0	jig		
		Bering Sea	-	Halibut 3	jig		
		Mekoryuk River	-	Tomcod 30	jig		
16 / 3	Mekoryuk River	Mekoryuk River	July 7, 31	Chum 7 Pink 27	net	Had a cool summer, slow fishing, late fish. Fish seem to be bigger than last year. Haven't really fished due to weather. Surveyed August 1.	no
		Bering Sea	-	P-cod 2 Halibut 12	jig / longline		
17 / 5	Paamiut	Paamiut River	July 8 - 10	Chum 255	Gill net	Weather was real good drying weather. More fish, more drying than last year, nothing different or unusual. Surveyed July 31	yes
		Southside	-	P-cod 9 Halibut 7	Jig		
		Mekoryuk River	-	Tomcod 100	Ice-jig		
18 / 2		Mekoryuk River	July 18	Chum 69 Pink 40	net	More fish, weather been pretty dry, maybe unusual. Surveyed August 1.	yes
		Bering Sea	-	Halibut 16	rod & reel		
19 / 10	n/a	Mekoryuk River	July 31	Pink 100+	net	Seems to be more fish this year. This past was nicer than this year. Surveyed August 1.	no
		Bering Sea		Halibut 4	jig		
		Mekoryuk River		Tomcod 30	jig		
20 / 4	n/a	Mekoryuk River	July (month)	Chum 70	net	Cooler this summer. Surveyed August 1.	yes

				Pink 10			
21 / 1	Mekoryuk River	Mekoryuk River	July (month)	Chum 175 Pink 78	net	No comment	yes
		Bering Sea	-	P-cod 23 Halibut 8	?		
22 / 1	Qengartaaremiut	Tacirmiut	2 days	Chum 100 Pink 10	gill net	Pretty warm out there, about 59F compared to last year 52F. More windy, good drying weather, south side – Tununeq. Saw a brown bubble fish, had dins all around with a short tail. Surveyed August 1.	yes
		Kuigaar (?)					
		West Nunivak	-	P-cod 120	jig / longline		
		North Mekoryuk	-	Halibut 50	jig / longline		
		Mekoryuk River	-	Tomcod 90	hook		
23 / 2	Nunarrlugarmiut	Main River	1 day	Chum 211	gill net	Sunshine, it's been cold, warm. Lot's more fish. Surveyed August 1.	yes
		Qanitar	-	Pink 116	gill net		
		Bering Sea	-	P-cod 22 Halibut 16	jig		
		Nelson Island	-	Herring 300	net		
		Mekoryuk River	-	Tomcod 180	hook		
24 / 2	-	Nunarrlugarmiut	-	Chum 56	net	Cold summer, last year better, calm warm, good weather, now weather is not good this summer. Survey date August 1.	nr
		Bering Sea	-	P-cod 8 Halibut 8	jig		
25 / 4	Nunarrlugarmiut	Iqangmiut & Kuigglugarmiut	16 hours	Chum 252	gill net	So much fish at Iqangmiut and Kuigglugarmiut Rivers. Never have seen so much in the 40+ years I have gone to fish camp. Weather was very dry, and really good for drying chum. Surveyed July 27.	yes
		Bering Sea (multiple sites)	-	Halibut 5	handline jig		
		Mekroyuk River	-	Tomcod 50	hook - ice		
26 / 4	Nunarrlugarmiut	Iqangmiut & Kuigglugarmiut	20 hours	Chum 296	gill net	Weather has been windy, halibut are small, more Pacific cod available. Surveyed July 30.	yes
		Kuigglugarmiut		Pink 4	gill net		
		Cape Etolin, Aqituq	-	P-cod 7	longline		
		Tacirrarmiut	-	Red Sal. 1	hand		
		Cape Etolin	-	Halibut 50	longline		
		Nelson Island	-	Herring 200	gill net		
		Mekoryuk River		Tomcod 50	hook – ice		
27 / 3	Paamiut	Paamiut	-	Chum 200	net	no comment	yes
		Bering Sea	-	P-cod 6 Halibut 4	jig		

Appendix G: 2006 Ocean and Stream Survey Results

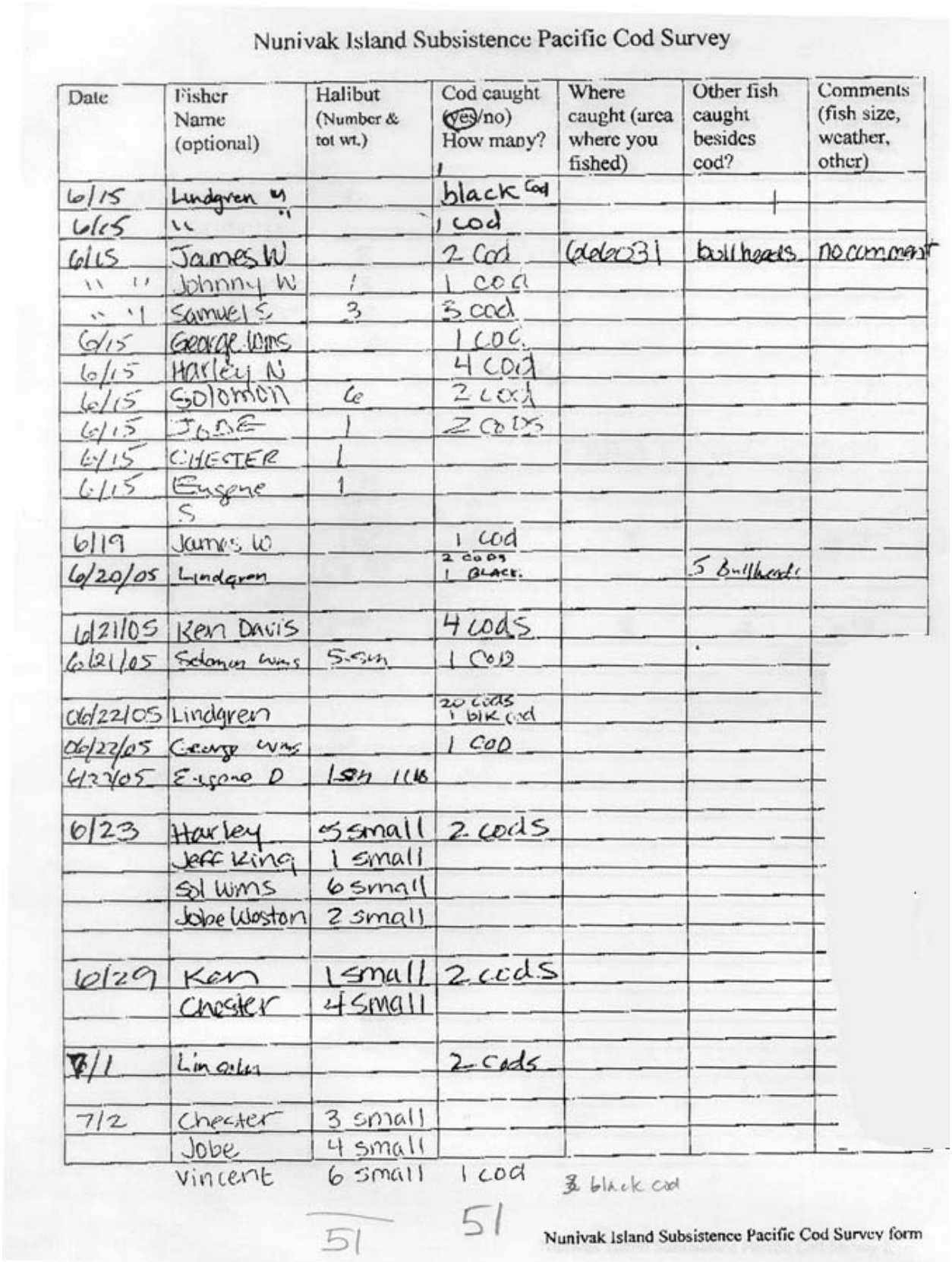
Date	Time	Area/Lat.-Long	Depth (m)	Species / Quantity	Comment
18June06	10:30a	Englullrarmiut	--	sculpin / several	Caught by rod and reel.
	12:50p		--	Pacific cod / 20	Observed on fishing boat. Weights vary from approximately 4.5 to 6.8 kg. Caught in vicinity of Cape Corwin.
	1:10p		--	Pacific cod / 18	Report obtained from passing boat, minimum estimated weight 4.5 kg.
	1:30p – 3:10p	Nuugavlarmiut, Etolin Strait 60°12.707 N; 165°38.610W to 60°13.316N; 165°39.074W	10.1	sculpin / 6 Pacific cod / 1	Fished approximately 1.5 km offshore. Cod size: weight, 2.52 kg; length, 68.6cm.
	3:15p – 4:05p	60°12.886 N; 165°37.555W	13.7	--	No fish taken.
	6:00p	Ingrimiut	--	--	Overnight camp at mouth of Ingrimiut River.
19June06	10:30a		--	--	Departed from camp on outgoing tide; estuary shallow, abundant clam shells visible on bottom, sandy with much eelgrass. Abundant flounders observed.
	1:15p	Qikertarrlugar	--	--	Observed herring spawn on seaweed at north side of island; flounders abundant between islet and Nunivak.
	7:30p	Nunarrlugarmiut	0 - 1.5		Set net in estuary below camp.
20 June06	8:00a			flounder / 29	Pulled set net, most of catch appears to be starry flounder; net choked with eelgrass.
	9:30a				Depart area.
	10:30a	Paamiut 59º54. 912N; 165º44.962W			Arrive and anchor at site. Recorded BIA ANCSA site tag with number AA-9254B at GPS coordinate 59º55.004 N 165º45.508W.
	12:35p – 2:55 p	Kiiwigmiut, Cayalegar Paamiut Kuigat 59º55.007N; 165º45.511W to 59º56.291N; 165º46.991W			Conducted pedestrian survey of stream. Main stream, Paamiut Kuigat is 6 – 8 m. wide with murky reddish color (iron or tannic). Depth varied from riffles to 1 m. or more. Streambed gravelly but very soft in places, especially along fringes. No evidence of fish observed. Cayalegar stream narrows to 1 m. with a swift current in places. Observed fingerlings (species?) immediately

					upstream of confluence of Cayalegar and Paamiut Kuigat.
	4:00p – 5:20p	59º51.418N; 165º48.672W	12.5	sculpin / 1	Ocean survey MD303P; Caught one "orange" sculpin said by captain to be "very rare" to Nunivak. Photo on file.
	5:30p – 7:30p	59º51.248N; 165º50.686W	17.1	Pacific cod / 3 halibut / 3	Cod size range: 2.7 – 4.3 kg.; Halibut 5.0 – 15.0 kg.
	8:00p	Nunarrlugarmiut			Overnight camp.
	9:55a – 10:55a	East Cape Mendenhall 59º48.629N; 166º04.555W	9.75	sculpin / 1	Ocean survey MD304P; Fish finder indicates heavy concentrations of fish; frequent nibbles on our herring bait. Pilot whales observed, captain speculates they are feeding on capelin.
21 June06	9:55a – 10:55a	East Cape Mendenhall 59º48.629N; 166º04.555W	9.75	sculpin / 1	Ocean survey MD304P; Fish finder indicates heavy concentrations of fish; frequent nibbles on our herring bait. Pilot whales observed, captain speculates they are feeding on capelin.
	11:05a – 11:20a	59º48.248N; 166º05.409W			No fish taken.
	11:30a – 2:00p	59º47.968N; 166º03.178W	16.6	Pacific cod / 4 halibut / 5	2 cod lost, 2 cod landed – 2.38kg / 66cm and 4.65kg / 76.2cm; halibut small ≤ 4.53kg., end survey MD304P
	2:15p	Qengartaaremiut			Large unoccupied fish camp. Stopped to haul spring water. Salmon observed jumping near shore.
	4:00p	Nunarrlugarmiut			Overnight camp.
22June06	9:20a				Depart camp, weather calm and foggy.
	11:00a	Penacuarmiut 59º51.378N; 166º30.570W			Establish camp.
	2:50p				Set net in estuary below camp.
	3:15p				Depart camp in Achilles for river survey; observe one salmon jumping before river forks.
	3:25p – 5:23p	Penacuarmiut Kuigat forks 59º52.024N; 166º30.192W			East fork clear and shallow, observed fingerlings (7.5 – 10cm) beneath overhanging willows.
		East fork upstream limit 59º52.382N; 166º30.023W			Overland hike to west fork
		West fork upstream limit 59º52.122N; 166º31.124W			No fish observed. Stream slightly more turbid than east fork with gravel bottom, many holes, 1-1.5 m deep.
	6:15p	Penacuarmiut		flounder	Checked set net.

				Dolly Varden (?)	Fished in stream by rod and reel, hooked and lost one fish.
23Jun06	8:00a			starry flounder / 46 yellowfin sole / 8 chum / 2 (one each sex)	Retrieved set net.
	9:07				Depart site for ocean survey.
	9:15a – 9:30a	59º50.599N; 166º31.152W	11.6		Attempt to anchor but wind forcing boat to cliffs. Depth finder showing a lot of activity but no fish taken.
	9:30a	59º50.191N; 166º31.25W to 59º50.228N; 166º30.727W	17.0		Returned to camp due to rough seas and approaching storm.
	11:15a	Penacuarmiut			Depart camp.
		Carwarmiut area			Attempt to enter Carwarmiut Kuigat, but difficulty finding mouth of stream. Jayalik River mouth is nearly merged with Carwarmiut Kuigat. Observed Jayalik River cutting down through 6-9m snow bank near mouth.
	2:30p – 5:36p	Jayalik River 59º55.263N; 166º48.551W(mouth) to 59º55.415N; 166º45.829W		Sculpin / 2 (dead); 3 spine stickleback / 2 (dead)	Conducted pedestrian survey. Depth of stream at mouth 15 – 43cm (low tide). Fingerlings observed in steam. Stream narrow, swift and clear – not red. Many deep pools
24Jun02	9:00a	Carwarmiut			Departed camp on incoming tide.
	10:45a	Tuqsug			Arrived to find fuel cache sabotaged. Heavy snow remains on cliff faces, increasing toward Tuqsug.
		Cingillret Kuigat 60º03.840N; 167º14.912W		red salmon / 3	Caught one sockeye by hand, lower reaches of stream are very shallow.
	12:05p	Tuqsug			Depart site ahead of schedule due to poor weather and approaching storm.
		Datheekook Pt	244.0	-	Less snow present on cliffs here, murres present.
	12:45p	Cape Mohican	-	-	Rounded cape. Intended to stop and camp at Nash Harbor, but continued to Mekoryuk due to poor weather and low fuel.
	3:10p	Mekoryuk			Arrived at base camp.

Summary: Results were compiled from 10 pelagic tests in 5 separate areas. Five reports were taken from fishers or by direct observation, two set nets in separate estuaries and six pedestrian stream surveys.
Fish Totals: Pacific cod: 8 (plus 38 reported from fishers); halibut: 8; sculpin: 8; yellow-fin sole: 8; chum salmon: 2; sockeye: 1; starry flounder: 29.

Appendix H: NRSP Sample Tally Sheet. Commercial Fishers' Incidental Catch.



Nunivak Island Subsistence Pacific Cod Survey

Date	Fisher Name (optional)	Halibut (Number & tot wt.)	Cod caught (yes/no) How many?	Where caught (area where you fished)	Other fish caught besides cod?	Comments (fish size, weather, other)
6/15	Lindgren "		black Cod			
6/15	" "		1 cod			
6/15	James W		2 Cod	Qdeb031	bullheads	no comment
" "	Johnny W	1	1 cod			
" "	Samuel S	3	3 cod			
6/15	George Wms		1 cod			
6/15	Harley N		4 cod			
6/15	Solomon	6	2 cods			
6/15	JOBE	1	2 cods			
6/15	CHESTER	1				
6/15	Eugene S	1				
6/19	James W		1 cod			
6/20/05	Lindgren		2 cods 1 black.		5 Bullheads	
6/21/05	Ken Davis		4 cods			
6/21/05	Solomon Wms	5-5m	1 Cod			
06/22/05	Lindgren		20 cods 1 blk cod			
06/22/05	George Wms		1 cod			
6/22/05	Eugene D	1 sm 11lb				
6/23	Harley	5 small	2 cods			
	Jeff King	1 small				
	Sol Wms	6 small				
	Jobe Weston	2 small				
6/29	Ken	1 small	2 cods			
	Chester	4 small				
7/1	Lincoln		2 cods			
7/2	Chester	3 small				
	Jobe	4 small				
	Vincent	6 small	1 cod			

3 black cod

51 51

Nunivak Island Subsistence Pacific Cod Survey form

Appendix I: Sample Household Survey Form.

Surveyors Initials
Survey Date July 3?

2006 Nunivak Subsistence Fish Survey

Name Joe and Margie David Number in household 2
Fishcamp name: Paamiut
Fish Site(s): Paamiut river, and Kwigglugaq
Dates fished (or number of days/hours): July 7 @ Kwig... 2 hours
Fish Species (Caught or observed):

Fish	# estimate	Location caught at	Method (net, rod/reel)
Chum Salmon	115	Kwigglugaq	net
Red Salmon			
Pink Salmon			
Other			

Did you meet your personal summer subsistence fishing goal? yes

In the past year did you fish for:

	Y/N	# estimate	Location caught at	Method (net, rod/reel)
Grayling	N			
Pacific cod	Y	20	Ocean	jig
Red salmon	N			
Halibut	Y	4	Ocean	jig
Herring	Y	100	By Airport	net and hand
Tomcod	Y	200	Mekoryuk River	jig

Any comments about weather, climate or fishing? (For example was this a typical year, are there more or less fish, was the weather different than in the past, did you notice anything different or unusual?)

It was good fishing. Good drying season, Sun shine, warm, lots of fish.

Appendix J: NPT Archives inventory December 6, 2005

Videocassette Tapes

Makepeace, Anne ca. 1998A. The Curtis Project, a film by Anne Makepeace. 17 minute video presentation to Smithsonian Institution. (copy on file at NPT archive, Mekoryuk)

Makepeace, Anne ca. 1998B-L. The Curtis Project, 11 VHS tapes of raw footage. Tapes are numbered 52 – 53, 57 – 62, 64 – 66. Include interviews with Howard Amos, Muriel Amos, Walter Amos, Nona Amos, George Williams Sr., Mildred Whitman, Jesse Moses, Emma Moses, Joe Moses. Also includes filming of Prudy Olrun's elementary class and "scenics." (copies on file at NPT archive, Mekoryuk. Anne Makepeace, Makepeace Productions 1763 Prospect Avenue #1, Santa Barbara, CA. 93103, (805)682-4935.)

Native Village of Mekoryuk 1996 Visit of Mekroyuk Elders to Smithsonian Institution in conjuction with Nunivak repatriation effort (four VHS tapes). Tape 1, February 9-10; Tape 5, February 14; Tape 6, February 14-15; Tape 7, February 15. (copies on file at NPT archive, Mekoryuk)

Native Village of Mekoryuk 1997A-E Dennis Griffin Interviews. Five VHS tapes.
1 – Walter Amos, Nona Amos, Harry Mike. Review of Amos Burg Photographs. Interviewer - Dennis Griffin, Interpreters – Howard and Muriel Amos, Camera – Pamela Easter. June 8, 1997;
2 - Mary Smith, Mildred Whitman, Susie Shavings. Interviewer - Dennis Griffin, Interpreter – Mona David, Camera – Pamela Easter. June 11, 1997;
3 – Mary Smith, Mildred Whitman, Susie Shavings. Interpreter - Mona David (June 11) and Walter Amos, Nona Amos. Interpreter – Howard Amos – (June 12). Review of Amos Burg Photographs. Camera – Pamela Easter. June 11-12, 1997;
4 – Two interviews, Walter Amos, Nona Amos. Interpreter – Howard Amos; and George Williams, Elsie Williams. Interpreter – Mona David. Interviewer – Dennis Griffin. Camera – Pamela Easter. June 12, 1997;
5 - Two interviews, George Williams, Elsie Williams, and Nan Kiokun. Interpreter – Mona David. Interviewer – Dennis Griffin. Camera – Pamela Easter. June 12-14, 1997.

NPT Collection – Ten VHS tapes
-Noatak, Andrew 10-21-88
-Williams, George Sr. n.d. Traditional Tale, "Up'aguar".
-Williams, George Sr. n.d. "Elder Interview"
-Amos, Walter Tut'qir, Mekoryuk, March 15, 1994
-"Elders Day" April 9, 1998
-Hendrickson, Kay, Mekoryuk, Jan 25, 1999 "songs" Tape No. 99MYU003v (two copies) Qiawig'ar
-Nuniwarmiut Kassiyuryarrat. "Nunivak Cultural Songs" "Nunivak Island Cultural Dancing" (may be same as 99MYU003v)
-Nuniwarmiut Kassiyurtait Dancers 10/2003
-KYUK, "Eyes of the Spirit
-Basketball Mekoryuk Boys 1996

Audio resources

BIA ANCSA Tape Collection, 176 Tapes 1975 – 1991. (Includes personal research tapes of Pratt and Drozda)

Griffin, Dennis Tape Collection, 60 Tapes. 1995-1998.

NPT Collection "A" 1998-99 uncataloged tapes

NPT Collection “B” approximately 80 cassette recordings, not cataloged.

Photograph Collections

Bird, Irving ca. 1923-1927 (copies courtesy Joann Arnall Boston)
Burg, Amos ca. 1950s (copies from Oregon Historical Society Archives)
Curtis, Edward S. 1927 (copies courtesy of Jim Graybill, grandson of Curtis)
Drozda, Robert 1986 – 2006 (courtesy of photographer)
Himmelheber, Hans 1937 (courtesy of photographer)
Stettenheim, Peter ca. 1950s (courtesy of photographer)
UAF – Snow, Lomen and Erskin (copied from University of Alaska, Fairbanks, Alaska and Polar Regions Archives)

Documents, Manuscripts and Maps

- picture writing from Edna Mathlaw
- Xerox copy of NPNP phase 1 maps

Griffin 1998 Reconstructing the History of Nash Harbor Settlement, Nunivak Island, Alaska: A cooperative Venture in Community Archaeology. Paper presented at the Alaska Anthropological Association’s Annual Meeting Anchorage, Alaska, March 19-21, 1998. 24pp. (Typescript in Possession of NPT)

Speaker, Stuart 1998 Ripples in the Bering Sea: research and Repatriation on Nunivak Island, Alaska. Repatriation Office, National Museum of Natural History, Smithsonian Institution. March 13, 1998. 7pp. (Typescript in Possession of NPT)

Speaker, Stuart 1996 with D. Kingston and K. Mudar) Inventory and Assessment of Human Remains and Funerary Objects from Nunivak Island, Alaska, in the National Museum of Natural History, Repatriation Office, Department of Anthropology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. (referenced in Stuart 1998)

United States Bureau of Indian Affairs, ANCSA Office. 1995. Nunivak Overview: Report of Investigations for BLM AA-9238 et al. 6 volumes. Kenneth L. Pratt, compiler, editor, and principal author. Anchorage, Alaska.

Amos, Howard and Muriel 2001 Cup’ig Phrase and Conversation Lessons. Compiled by Howard T. (Nakaar) Amos, Edited by Nussaalar Muriel M. Amos. Adapted from Yup’ik Phrase and Conversation Lessons by Anna Jacobson, Alaska Native Language Center, University of Alaska, Fairbanks. (16 copies on shelf)

"This is a cod. What's wrong with this cod anyhow? It is said that the cod used to be fat and oily. At the time the cod was fat, a king salmon desired to own its fat. The king salmon then snatched its fat barbel away; as the king salmon longed for its fat, it asked the cod. Upon that request, although the cod complained, its fat was suddenly transferred leaving it skinny and the king salmon fat and oily." - Based on a translation of traditional story told by Nan Kiokun.

Spirit of a Codfish. Based on original drawing by Timothy Kangleg for Hans Himmelheber, probably at Nash Harbor in 1937 (in Himmelheber 1993:57).